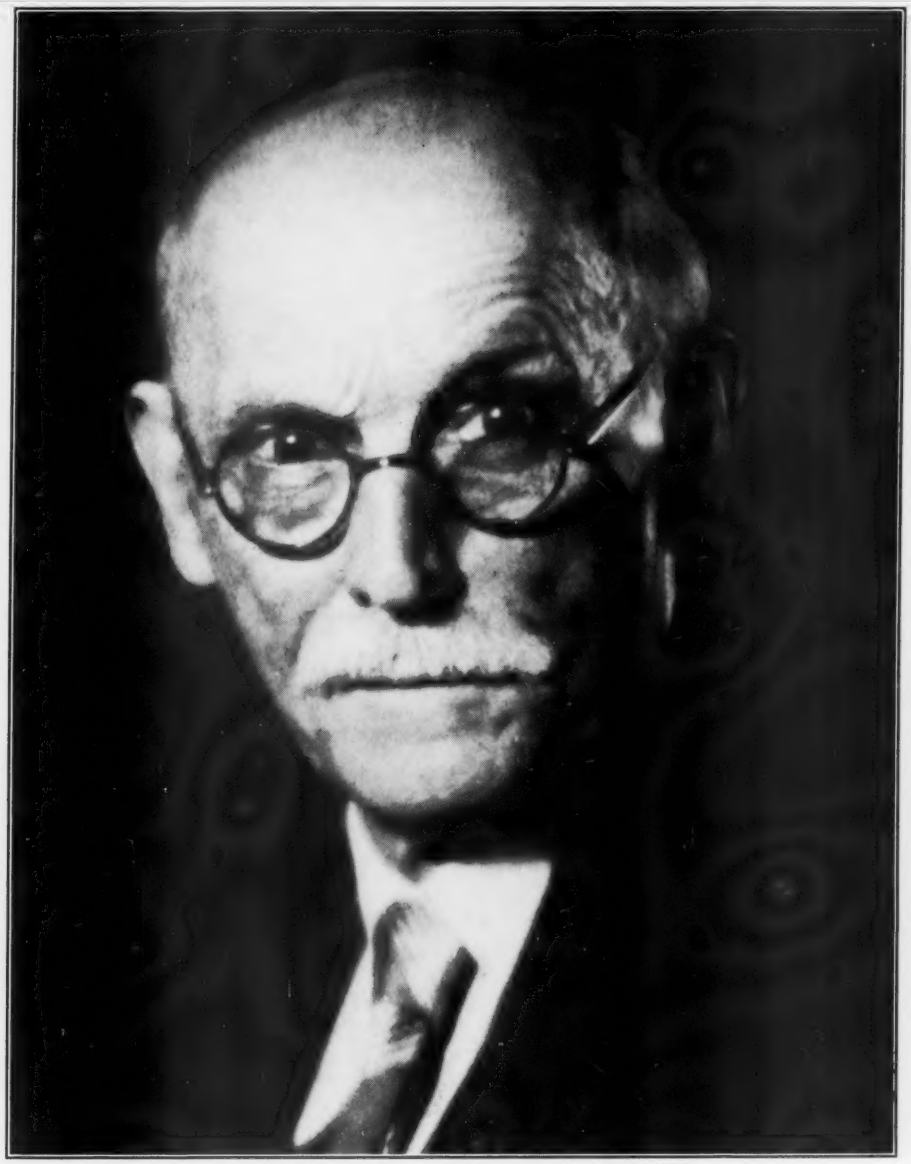
THE BULLETIN

OF THE

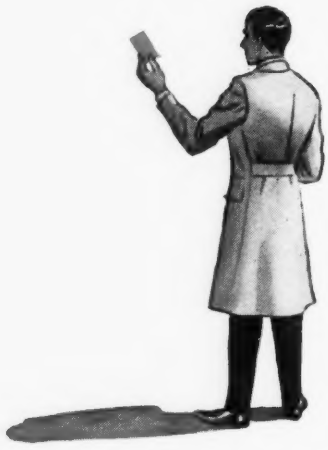
AMERICAN CERAMIC SOCIETY

Volume 18 MAY, 1939 Number 5



ELLSWORTH WOODWARD, 1861–1939

For story, see page 179



We've matched about everything EXCEPT A Pink Elephant

● If you were to look over our shoulder as we opened our mail your eyes would literally pop at some of the strange articles that cross our desk.

One envelope will contain a swatch snipped from a pair of lounging pajamas. Out of another envelope will come a gayly colored feather. Still another package may contain a bottle of Coca-Cola, or a piece of building material from the New York World's Fair, or a section of elastic from a pair of suspenders.

Our job is to match these assorted items with colors that will be used on glass, porcelain enamel, pottery, tile and heavy clay products. Seldom can we compromise.

Because they know that they can depend on us to come through, a majority of the country's leading producers of ceramic products call us in on their color matching problems. In fact, they've been doing it for seventy years.

Whether it's samples or help you want, just drop us a line.

METALLIC OXIDES — CHEMICALS AND SUPPLIES

ESTABLISHED 1869

B. F. DRAKENFELD & COMPANY, INC.

45-47 PARK PLACE · NEW YORK, N. Y.

WORKS: WASHINGTON, PA.

BRANCHES
East Liverpool, Ohio · Chicago, Ill.

PACIFIC COAST AGENTS
Braun Corp., Los Angeles · Braun-Knecht-Heimann Co., San Francisco

THE BULLETIN OF THE AMERICAN CERAMIC SOCIETY

Volume 18 **May, 1939** **Number 5**

CONTENTS

Activities

Officers, Trustees, and Committees, 1939–1940
A. I. Andrews, President—J. L. Carruthers, Vice-President 159
C. F. Tefft, Treasurer—F. B. Ortman, Terra Cotta Division Trustee 160
A. F. Greaves-Walker, Structural Clay Products Division Trustee—H. B. DuBois, Materials and Equipment Division Trustee 161
Officers and Division Trustees—Officers of Divisions, Fellows, and Local Sections 162
Divisions, Official Personnel, 1939–1940 163
Honorary Members Elected, 1939 159
Fellows Elected, 1939 160
Local Sections: Michigan-Northwestern Ohio 161
Membership Record Page to April 18, 1939 164
New Members—Roster Changes 164–65
Golden Gate General Meeting, San Francisco, Calif., August 6–12: Ceramic Exhibit in Mines Building 166
Exhibit Photos of Ceramic Products: Structural Clay, Art, Historic, and Industrial—Gladding, McBean, & Co. Pottery Display 166–69
Ceramic Decorative Arts Display—Points of Interest near San Francisco 168
Golden Gate Pool of Enchantment (photo) 169
San Francisco Hotel Rates—Treasure Island (photo) 170
Golden Gate Court of Reflections (photo) 190
Ceramic School Notes: University of Illinois Clay Products Plant Operators, Conference—Massachusetts Institute of Technology Glass Fracture Study—Keramos Ohio State Chapter 171
H. C. Harrison at New York State College of Ceramics 172
Student Branch News: Rutgers University—Missouri School of Mines 171
Georgia School of Technology Annual Report—Ohio State University—University of North Carolina (Raleigh Branch) 172
Report of Committee on Ceramic Education 173
Necrology: R. J. Rees 173
J. L. Green—G. A. Balz 174

Notes

P. P. Budnikoff, Member of U.S.S.R. Academy of Sciences—Dr. Silverman Honored Abroad—P. Orvin, Is Not a Member of This Society 175
American Refractories Institute Technical Advisory Committee (photo) 175
New High-Test Safety Glass, Franklin Institute Demonstration 176
All-Mirror Wall, Glass Murals in Chicago Restaurant—Routine Sampling Atmosphere Impurities 177
International Congress on Glass Postponed 178

Ceramic History

Ellsworth Woodward 179
Historical Data on the American Ceramic Society 180
Check List of Early New England Potteries—Compiled by F. H. Norton 181

Communications

A Potter Looks at Chinese Antiques—W. A. Weldon 185
Lithium Compounds in 1938 186
Identification of Inclusions in Steel by R. B. Sosman—How to Fire Fresh Grog by J. F. Trevor 187
Suggestions for Writing Batch Specifications by J. E. Boyd 187
I: Gas Clouding of Enamel by Alfred Horn 188
History of Ceramic Guild of Cincinnati by Mary G. Sheerer 189

Advertisers' Index 6

Buyers' Guide 9–12

Publication Office: 20th & Northampton Sts., Easton, Pa.
Editorial and Advertising Office: 2525 N. High St., Columbus, Ohio.
Executive Office: 2525 N. High St., Columbus, Ohio.

Committee on Publications: J. D. Sullivan, *Chairman;* E. E. Marbaker, A. N. Finn, W. W. Winship, Ross C. Purdy.

Entered as second-class matter at the post office at Easton, Pa., under the act of March 3, 1879. Published monthly.
Subscription $1.50 a year. Single numbers twenty-five cents.
(Foreign and Canadian postage, 50¢ additional on subscriptions)

(Copyright 1939, American Ceramic Society, Inc.)

Lancaster

DRY MIXING OPERATIONS POINT TO "LANCASTER"

Illustrating how material is conveyed by the clockwise rotating pan and deflected by a stationary side wall plow into the path of the counter-clockwise rotating plows and muller. A new and scientific mixing operation.

The advancement to dry mixing, as successfully established in the Ceramic Industry by "Lancaster" Mixers, carries along with it scientific control of materials not obtainable by other processing.

For example, users tell us time after time, that their ware shows considerably improved strength, both dry and burned, which they trace to the definite inclusion of body properties that were formerly lost in process.

We have been advised repeatedly that the even dispersement of moisture which the "Lancaster" System provides establishes a body uniformity which is always dependable, and which can be scientifically adapted to their processing. Because of this control, large reductions in drying and burning losses have been consistently maintained.

Economy in power, saving as much as 70% of required input, and economy in labor, with savings from 30% to 50% are consistently factors of merit to dry mixing with "Lancaster" Mixers.

Your interest in this "up to the minute" processing is invited. Write for descriptive Bulletin 70 on "Lancaster" Mixing Equipment, and also information as to recommended units for your requirements. No obligation.

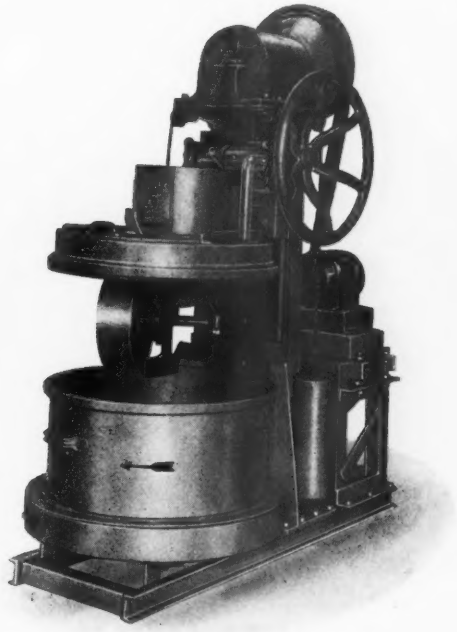
LANCASTER IRON WORKS, INC.
BRICK MACHINERY DIVISION
LANCASTER, PENNA., U. S. A.

Lancaster

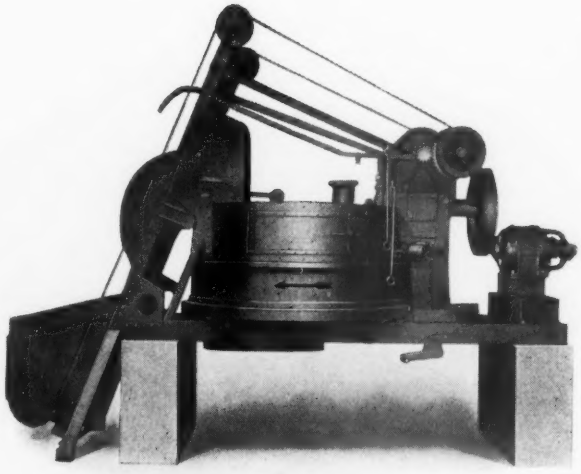
SCIENTIFIC MIXING

FOR

CERAMICS—
REFRACTORIES—
ABRASIVES—
GLASS—
ENAMELS—



The No. 1 "Lancaster" Mixer. A heavy duty unit for a range of batch sizes from ⅜ cu. ft. minimum to 2 cu. ft. maximum.



The EAG-3 or EAG-4 "Lancaster" Mixer fitted with full batch elevator hopper and dust tight cover. For a range of batch capacities to 72 gals. or 9 cu. ft.

Dry Mixing recommendations submitted on request, without obligations. Merely advise us of your daily capacity and we will cheerfully help you work up plans for an installation of "Lancaster" Mixing Equipment to improve production and lower costs.

LANCASTER IRON WORKS, INC.
BRICK MACHINERY DIVISION
LANCASTER, PENNA., U. S. A.

KAMEC

THE SUPERIOR KAOLIN

ASSURED UNIFORMITY
AMPLE STOCK

DEPENDABLE RESERVES
PROMPT SHIPMENTS

You Are Invited To Visit Our Plant

KAOLIN INCORPORATED
Main Office, Mine and Mill - SPRUCE PINE, N. C.
INDIANAPOLIS OFFICE - - - - 1511 W. WASHINGTON ST.

THREE ELEPHANT

AND BORIC ACID
GUARANTEED OVER 99.5% PURE
AMERICAN POTASH & CHEMICAL CORPORATION
70 Pine Street, New York

WANTED TO BUY OUT-OF-PRINT
Journals of
The American Ceramic Society

June, 1922, Part II
1923 Yearbook
1924 February
1933 January
February
1934 January Bulletin
February Journal
January Journal
March Bulletin
April Bulletin
1938 April Bulletin
1936 June Bulletin

THE AMERICAN CERAMIC SOCIETY
2525 North High Street Columbus, Ohio

Tunnel, Truck and Humidity Dryers
for—
Dry Pressed Electrical Porcelain
High Voltage Electrical Porcelain
Sanitary Porcelain
Floor and Wall Tile
Abrasive Wheels
Glass Pots and Blocks
Refractory Bricks and Shapes
Also Stove Rooms and Mangles for General Dinnerware

PROCTOR & SCHWARTZ, INC.
The Largest Builders of Drying Machinery for Industry
Seventh Street & Tabor Road, Philadelphia, Pa.

THE HOUSE OF HOMMEL
SUPPLIERS OF ALL CERAMIC NEEDS

Quality
FRITS
COLORS
CHEMICALS
Stocked for
IMMEDIATE
SHIPMENT

THE
O. HOMMEL CO.
Quality First - Since 1891
209 Fourth Avenue Pittsburgh, Pa.
LET OTHERS IMITATE -:- WE ORIGINATE

Pacific Coast Agents
L. H. BUTCHER CO.
Los Angeles - Salt Lake City - San Francisco - Portland - Seattle

for—

A high gloss glaze
free from pinholes

we suggest

LITHIUM CARBONATE

consult—

FOOTE MINERAL CO.
1605 Summer St., Phila., Pa.

JOURNAL OF THE SOCIETY OF GLASS TECHNOLOGY

A bimonthly Journal containing the original papers communicated to the Society together with abstracts of other papers covering the whole field of glass technology.

Membership of the Society is open to all persons, or associations of persons, interested in glass.

Orders and enquiries should be addressed to—

The Secretary,
Society of Glass Technology,
The University,
"Elmfield," Northumberland Road,
SHEFFIELD, 10, England.

SOLVAY
TRADE MARK REG. U. S. PAT. OFF.
dustless dense
SODA ASH

Made Especially for the Glass Maker

Specify SOLVAY when you buy Soda Ash because Solvay is and has been the standard of quality since 1881. It offers the following advantages:

1. More than 99.50% Sodium Carbonate (dry basis).
2. Proper granulation and absolute uniformity in quality.
3. Your choice of Soda Ash graded for efficient use with any of the known commercial glass sand.
4. The services of a well organized technical staff which is available to Solvay customers.

Make Solvay your source of supply for
POTASSIUM CARBONATE
98–100% Calcined Dustless
83–85% Granulated Hydrated
CAUSTIC POTASH
Liquid—Solid—Lump—Flake—Ground

Full information sent on request.
SOLVAY SALES CORPORATION
Alkalies and Chemical Products Manufactured by The Solvay Process Company
40 RECTOR ST. NEW YORK, N. Y.

ALPHABETICAL LIST OF ADVERTISERS

	Page
American Potash & Chemical Corporation	4
American Telephone & Telegraph Co	24
Bethlehem Steel Company	16
Buyers' Guide	9–12
Celo Mines, Inc	*E161
Ceramic Color & Chemical Mfg. Company	20
Chicago Vitreous Enamel Product Company	16
Corhart Refractories Company	14
Drakenfeld, B. F., & Co	Inside Front Cover
Du Pont de Nemours, E. I., & Company	21
Edward Orton, Jr., Ceramic Foundation	20
Foote Mineral Co	5
Frazier-Simplex, Inc	15
Great Lakes Foundry Sand Co	8
Hammill & Gillespie, Inc	16
Harshaw Chemical Co	19
Hartford-Empire Company	20
Hommel, O., Company	5
Kaolin, Inc	4
Lancaster Iron Works, Inc	2–3
Maxson, Elwyn L	13
McDanel Refractory Porcelain Company	23
Metal & Thermit Corporation	Outside Back Cover
Montgomery Porcelain Products Co	6
National Engineering Co	18
Orton, Edward, Jr., Ceramic Foundation	20
Pacific Coast Borax Company	18
Paper Makers Importing Company	13
Pennsylvania Salt Mfg. Co	7
Porcelain Enamel & Mfg. Company	23
Potters Supply Company	17
Professional Directory	23
Proctor & Schwartz, Inc	16
Ransome Concrete Machinery Co	17
Society of Glass Tech	5
Solvay Sales Corporation	5
Spinks, H. C., Clay Company	Inside Back Cover
Swindell-Dressler Corp	23
United Clay Mines Corp	23
Vitro Mfg. Company	6
Willson Products, Inc	17
Wilson, H. W., Company	18

* Page marked E appears in Editorial Section.

MONTGOMERY PORCELAIN PRODUCTS COMPANY

SPECIALIZING IN

Primary Protection Tubes for all makes of Pyrometers

★ CORUNDUM
★ MULLITE
★ REFRACTORY PORCELAIN

MONTGOMERY PORCELAIN PRODUCTS CO.
FRANKLIN OHIO

PRODUCTS
of Proven Merit
— SINCE 1909 —

THERE is satisfaction in knowing that the colors you buy for your products are of finest quality and consistently dependable.

When you buy Vitro Colors, Opacifiers and Chemicals you buy products of merit.

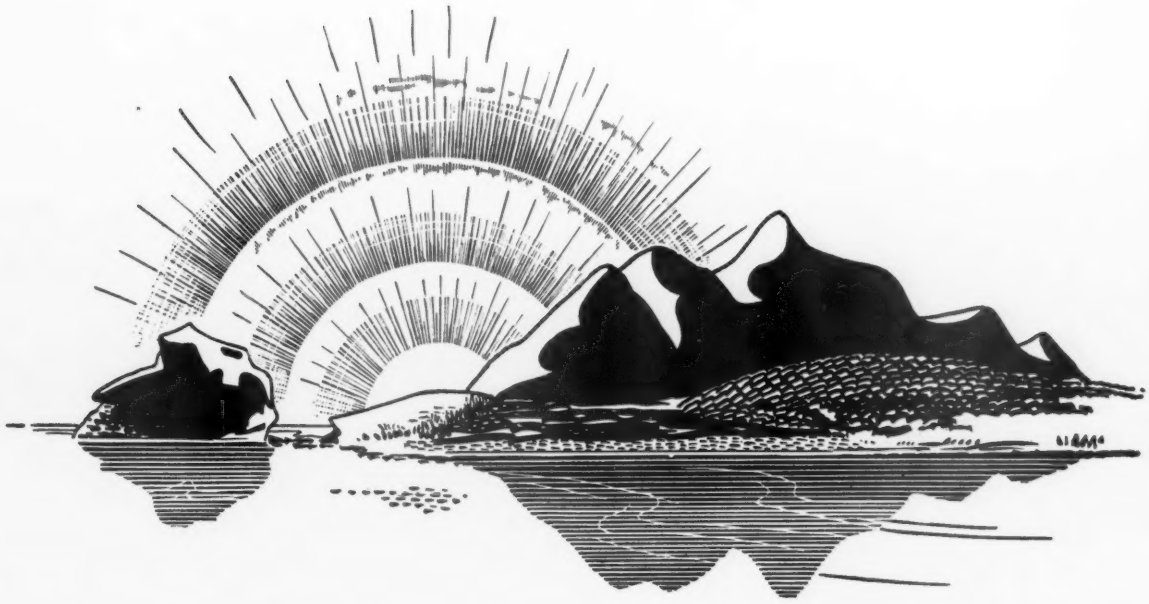
✦ ✦ ✦

Opacifiers and Oxides for Enamels
Acid and Sulphide Resisting Glass Colors
Modern Glaze Stains and Overglazes
Chemicals for Ceramic Use

THE VITRO MFG. CO.
Corliss Station, Pittsburgh, Pa.

California Branch:
16 California St., San Francisco

VITRO PRODUCTS



FROM GREENLAND'S ICY MOUNTAINS

COMES ANOTHER KIND OF "ICE" THAT HELPS TO MAKE SUPERIOR ENAMELS

Natural Greenland cryolite was sometimes called the "kind of ice that neither floats nor melts." And in fact the natural mineral has a truly ice-like appearance when immersed in water.

At first a scientific curiosity, this material was soon found to have properties that are invaluable in the production of fine enamels and glass. It is known today to the ceramic industry as Kryolith — fluoride flux and opacifier.

Due to its ability to dissolve nearly all the minerals commonly used in enamel and glass manufacture, Kryolith is an exceedingly strong flux. The corrosive attack on the batch ingredients starts well below the melting temperature of the pure mineral. As an opacifier, it is exceedingly economical for this action is accomplished incidentally while Kryolith is acting as a flux.

Kryolith is combined by Nature as a stable double fluoride, and it is the only genuine, natural Greenland cryolite imported, refined, and sold in North America. Be sure the frit you buy is made with the genuine natural material — Kryolith.

Pennsylvania Salt Manufacturing Company, Widener Bldg., Philadelphia, Pa. — New York · Chicago · St. Louis · Pittsburgh · Tacoma · Wyandotte.

Kryolith
THE NATURAL GREENLAND CRYOLITE

PENNSYLVANIA SALT
MANUFACTURING COMPANY
Chemicals

QUESTION: Can we save money?

ANSWER: Yes! Whether you make glass, enamel or white ware, the temperature necessary to produce your product can be lowered. This reduces fuel consumption and prolongs refractory life.

QUESTION: Is the cost of Nepheline Syenite higher than that of material which it replaces?

ANSWER: No! In most cases, costs are materially reduced.

QUESTION: How about iron oxide?

ANSWER: The iron oxide content of Lakefield Nepheline Syenite is so low that it is possible to improve the color of most ceramic products.

QUESTION: Who is using Lakefield Nepheline Syenite?

ANSWER: Numerous glass plants, potteries and enamel manufacturers—large and small.

QUESTION: How large are your Lakefield deposits?

ANSWER: Probably 5,000,000 tons.

QUESTION: How about analyses?

ANSWER: Screen and chemical analyses are furnished with every carload.

QUESTION: How about Service?

ANSWER: We ship promptly Summer and Winter. Our Rochester (N. Y.) Mill has been enlarged. Our bins are kept filled.

Nepheline Syenite saves money! It eliminates trouble from variations! Wire or write for detailed information!

Great Lakes
FOUNDRY SAND COMPANY — DETROIT
CERAMIC DIVISION
HIGH ALUMINA CONTENT • IDEAL FLUXING PROPERTIES

Lakefield **NEPHELINE SYENITE**

Abrasives
Carborundum Co. (*Carborundum and Aloxite*)
Celo Mines, Inc. (*Almanite Garnet*)
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
Norton Co. (*Alundum-Crystolon*)

Air Conditioning Systems
Frazier-Simplex, Inc.

Aloxite (Refractory Products)
Carborundum Co.

Alumina (Hydrate and Calcined)
Ceramic Color & Chemical Mfg. Co.
Drakefeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Alumina (Fused) Brick and Tile
Pennsylvania Salt Mfg. Co.
The Vitro Mfg. Co.

Aluminum Oxide (Calcine)
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.
The Vitro Mfg. Co.

Aluminum Oxide (Fused)
Carborundum Co.
Harshaw Chemical Co.
Norton Co.
The Vitro Mfg. Co.

Alundum (Refractory Products)
Norton Co.

Ammonium Bicarbonate
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Solvay Sales Corp.

Ammonium Bifluoride
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Ammonium Carbonate
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Antimony Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Antimony Sulphide
The Hommel Co., O., Inc.

Arches (Interlocking, Suspending, and Circular)
Frazier-Simplex, Inc.

Arsenic
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Automatic Brick Car Loaders
Lancaster Iron Works, Inc.

Ball Mills
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
McDanel Refractory Porcelain Co.
The Vitro Mfg. Co.

Ball Mills (Laboratory Type)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Barium Carbonate
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Basic Oxides
Porcelain Enamel and Mfg. Co.

Batch Systems
Frazier-Simplex, Inc.
Lancaster Iron Works, Inc.
National Engineering Co.

Batts
Carborundum Co. (*"Carbofrax Aloxite"*)
Denver Fire Clay Co.
Norton Co. (*Alundum-Crystolon*)

Benders (Bar)
Ransome Concrete Machinery Co.

Bichromate of Soda
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Bitstone
Potters Supply Co.

Blocks (Refractory)
Carborundum Co.
Chicago Vitreous Enamel Product Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Louthan Mfg. Co.
Norton Co.
The Vitro Mfg. Co.

Body Stains
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
The Hommel Co., O., Inc.

Bone Ash
Denver Fire Clay Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Borax
American Potash & Chemical Co.
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pacific Coast Borax Co.
The Vitro Mfg. Co.

Borax Glass
American Potash and Chemical Corp.
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pacific Coast Borax Co.
The Vitro Mfg. Co.

Boric Acid (Anhydrous)
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pacific Coast Borax Co.
The Vitro Mfg. Co.

Boric Acid (Crystal, Granular, or Powder)
American Potash & Chemical Corp.
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pacific Coast Borax Co.
The Vitro Mfg. Co.

Boron Carbide
Norton Co.

Brick Machines (also Barrows, Molds)
Lancaster Iron Works, Inc.

Brick (Refractory)
Carborundum Co. (*"Carbofrax Aloxite"*)
Chicago Vitreous Enamel Product Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Norton Co.
The Vitro Mfg. Co.

Buckets (Concrete, Elevator)
Ransome Concrete Machinery Co.

Cadmium Sulphide
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Carbofrax (Refractory Products)
Carborundum Co.

Carbonates (Barium, Lead)
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Castings
Lancaster Iron Works, Inc.

Castings (Abrasive Resisting)
Bethlehem Steel Co.

Caustic Potash
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Solvay Sales Corp.

Caustic Soda
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.
The Vitro Mfg. Co.

Cements
Carborundum Co.
Chicago Vitreous Enamel Product Co.
Corhart Refractories Co.
Norton Co.
Pennsylvania Salt Mfg. Co.

Ceramic Chemicals
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc. R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
Pennsylvania Salt Mfg. Co.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Cerium Oxide
Drakenfeld, B. F., & Co.

Chromium Oxide
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Clay (Ball)
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Paper Makers Importing Co.
Potters Supply Co.
Spinks, H. C., Clay Co.
The Vitro Mfg. Co.
United Clay Mines Corp.

Clay (Bentonite)
Wyodak Chemical Co.

Clay (Block)
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Clay (China)
Ceramic Color & Chemical Mfg. Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.
The Vitro Mfg. Co.
United Clay Mines Corp.

Clay—Cleaners, Feeders
Lancaster Iron Works, Inc.

Clay (Electrical, Porcelain)
Ceramic Color & Chemical Mfg. Co.
Hammill & Gillespie, Inc.
The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Old Hickory Clay Co.
Paper Makers Importing Co.
Spinks, H. C., Clay Co.
United Clay Mines Corp.

Clay (Enamel)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Metal & Thermit Corp.
Paper Makers Importing Co.
Porcelain Enamel and Mfg. Co.
Spinks, H. C., Clay Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.
United Clay Mines Corp.

Clay (Fire)
Denver Fire Clay Co.
Maxson, Elwyn L.
Paper Makers Importing Co.
Potters Supply Co.
United Clay Mines Co.

Clay (German Vallendar)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.

The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Clay (Micronized)
Porcelain Enamel and Mfg. Co.

Clay Miners
Maxson, Elwyn L.
Paper Makers Importing Co.
Spinks, H. C., Clay Co.
United Clay Mines Corp.

Clay (Potters)
Denver Fire Clay Co.
Hammill & Gillespie, Inc.
The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Paper Makers Importing Co.
Spinks, H. C., Clay Co.
United Clay Mines Corp.

Clay (Process Equipment)
Lancaster Iron Works, Inc.
National Engineering Co.

Clay (Sagger)
Georgia Kaolin Co.
The Hommel Co., O., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Paper Makers Importing Co.
Potters Supply Co.
Spinks, H. C., Clay Co.
United Clay Mines Corp.

Clay-Slip (Albany)
Hammill & Gillespie, Inc.
United Clay Mines Corp.

Clay (Wad)
Kentucky Clay Mining Co.
Potters Supply Co.
Spinks, H. C., Clay Co.
United Clay Mines Corp.

Clay (Wall Tile)
Hammill & Gillespie, Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Old Hickory Clay Co.
Paper Makers Importing Co.
Spinks, H. C., Clay Co.
United Clay Mines Corp.

Cleaners
Pennsylvania Salt Mfg. Co.
Porcelain Enamel and Mfg. Co.

Cleaners, Chemical
Harshaw Chemical Co.
Pennsylvania Salt Mfg. Co.

Clocks (Gauge Board)
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.

Cobalt Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Cobalt Sulphate
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Colors
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Concrete (Chutes, Grouters)
Ransome Concrete Machinery Co.

Cones
The Edward Orton, Jr., Ceramic Foundation

Conveying Equipment
Frazier-Simplex, Inc.
Lancaster Iron Works, Inc.
National Engineering Co.

Copper Oxide
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Corhart
Corhart Refractories Co.

Cornwall Stone (Imported)
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.

Crucibles (Filter, Melting, Ignition)
Carborundum Co.
Denver Fire Clay Co.
Norton Co.
Potters Supply Co.

Crushers (Clay)
Lancaster Iron Works, Inc.

Cryolite (see Kryolith)
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.
The Vitro Mfg. Co.

Crystolon (Refractory Products)
Norton Co.

Cullet, Washing Plants, Incinerators, Crushers
Frazier-Simplex, Inc.

Cutters (Bar)
Ransome Concrete Machinery Co.

Decorating Supplies
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Disintegrators
Lancaster Iron Works, Inc.
National Engineering Co.

Dryer (Pipe Rack)
Lancaster Iron Works, Inc.

Drying Machinery
Frazier-Simplex, Inc.
Lancaster Iron Works, Inc.
Proctor & Schwartz, Inc.

Electrocast Refractories
Corhart Refractories Co.

Enamelers' Borax
Porcelain Enamel and Mfg. Co.

Enameling Equipment (Complete)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Frazier-Simplex, Inc.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Enameling Furnaces
Carborundum Co.
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Electro Refractories & Alloys Corp.
The Hommel Co., O., Inc.
Lancaster Iron Works, Inc.
Norton Co.

Enameling Iron (Sheet)
American Rolling Mill Co.
Bethlehem Steel Co.

Enameling Muffles
Bethlehem Steel Co.
Carborundum Co. (*Carbofrax*)
Chicago Vitreous Enamel Product Co.
Electro Refractories & Alloys Corp.
Frazier-Simplex, Inc.
Norton Co. (*Alundum*)

Enameling (Practical Service)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Enamels
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Enamel Oxide
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Enamels (Porcelain)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Equipment (Porcelain Enameling)
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The DeVilbiss Co.
The Hommel Co., O., Inc.

Exhaust Systems
The DeVilbiss Co.

Feldspar
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Filter Fabrics
Metakloth Company

Fire Brick
Carborundum Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Norton Co.

Fire Brick—Process Equipment
Lancaster Iron Works, Inc.

Fire Clay
Denver Fire Clay Co.
Spinks, H. C., Clay Co.

Flint
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.
Porcelain Enamel and Mfg. Co.

Flint Pebbles
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Floors (Non-Slip)
Norton Co.

Fluorspar
Harshaw Chemical Co.
The Hommel Co., O., Inc.

French Flint
Maxson, Elwyn L.
Paper Makers Importing Co.

Frit
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Frosting Mixtures
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Fuel Oil Systems and Control, Stokers
Bethlehem Steel Co.
Frazier-Simplex, Inc.

Furnaces
Carborundum Co. (*Carboradiant*)
Chicago Vitreous Enamel Product Co.
Denver Fire Clay Co.
Frazier-Simplex, Inc.
The Hommel Co., O., Inc.
Swindell-Dressler Corp.

Furnaces, Enameling
Swindell-Dressler Corp.

Glass Bending Ovens, Glass Decorating Machines
Frazier-Simplex, Inc.

Glass Equipment
Hartford-Empire Co.
Lancaster Iron Works, Inc.

Glass Melting Tanks and Furnaces
Frazier-Simplex, Inc.

Glass Thickness Gauge
Bausch & Lomb Optical Co.

Glaze and Body Spar
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Glazes and Enamels
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Glaze Spar
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.

The Hommel Co., O., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.

Goggles
The Hommel Co., O., Inc.
Willson Products, Inc.

Gold
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Gold Decorations
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
The Hommel Co., O., Inc.

Granulators
Lancaster Iron Works, Inc.

Grinding Wheels
Carborundum Co. (*Carborundum and Aloxite*)
Chicago Vitreous Enamel Product Co.
Norton Co. (*Alundum-Crystolon*)

Hearths
Carborundum Co. (*Carbofrax* heat treating)
Corhart Refractories Co.
Norton Co. (*Crystolon*)

Hearths (High Aluminous Clay, Electrically Sintered Aluminum Oxide, Silicon Carbide)
Carborundum Co.
Norton Co.

Hoppers (Floor, Tower)
Ransome Concrete Machinery Co.

Hose (Air and Fluid)
The DeVilbiss Co.

Hydrofluoric Acid
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Iron Chromite
Harshaw Chemical Co.

Iron (Enameling)
American Rolling Mill Co.
Bethlehem Steel Co.

Iron Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.
The Vitro Mfg. Co.

Kaolin
Ceramic Color & Chemical Mfg. Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.
United Clay Mines Corp.
The Vitro Mfg. Co.

Kilns, China (Decorating)
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Frazier-Simplex, Inc.
The Hommel Co., O., Inc.
Swindell-Dressler Corp.

Kilns- (Electric, Circular, Tunnel)
Swindell-Dressler Corp.

Kiln Furniture (Silicon Carbide, Semi-Silicon Carbide) (Refractory)
Louthan Mfg. Co.

Kyanite
Celo Mines, Inc.

Kryolith (see Cryolite)
Pennsylvania Salt Mfg. Co.

Laboratory Ware
Norton Co.

Lehr Tile (High Aluminous Clay, Electrically Sintered Aluminum Oxide, Silicon Carbide)
Carborundum Co.

Lehrs
Frazier-Simplex, Inc.
Swindell-Dressler Corp.

Lehrs (Electric or Fuel Heated)
Frazier-Simplex, Inc.
Swindell-Dressler Corp.

Lehr Loaders
Frazier-Simplex, Inc.

Linings (Furnace Refractory, Block Refractory Plate, Brick, and Tile)
Carborundum Co.
Chicago Vitreous Enamel Product Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Norton Co.
The Vitro Mfg. Co.

Lithium Carbonate
Drakenfeld, B. F., & Co.

Loaders (Bucket)
National Engineering Co.

Magnesia (Fused)
Norton Co.

Magnesia (Sintered, Calcined)
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.

Magnesite
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Magnesite Calcined
The Hommel Co., O., Inc.

Magnesium Carbonate
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Manganese
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Manganese Dioxide
Drakenfeld, B. F., & Co.

Manganese (Oxide)
Ceramic Color & Chemical Mfg. Co.
Corhart Refractories Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Masks (Breathing)
The DeVilbiss Co.
Drakenfeld, B. F., & Co.
Willson Products, Inc.

Metals (Porcelain Enameling)
American Rolling Mill Co.
Bethlehem Steel Co.

Micronized Products
Porcelain Enamel and Mfg. Co.

Microscopes (Polarizing)
Bausch & Lomb Optical Co.

Minerals
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Mixers
National Engineering Co.
Ransome Concrete Machinery Co.

Mixers (Batch)
Lancaster Iron Works, Inc.
National Engineering Co.

Mixers (Concrete, Paving, Road Paving, Plaster, Asphalt, Truck, Mortar, Bituminous)
Lancaster Iron Works, Inc.
Ransome Concrete Machinery Co.

Mixers (Laboratory)
Lancaster Iron Works, Inc.
National Engineering Co.

Mold Sanders
Lancaster Iron Works, Inc.

Muffles (Furnace)
Carborundum Co. (*Carbofrax*)
Chicago Vitreous Enamel Product Co.
Denver Fire Clay Co.
Frazier-Simplex, Inc.
Norton Co.

Mullers (Batch)
Lancaster Iron Works, Inc.
National Engineering Co.

Muriatic Acid
Denver Fire Clay Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.

Needle Antimony
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Nickel Salts
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Nitrates (Cobalt, Sodium)
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Nitre
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Norbide (Norton Boron Carbide)
Norton Co.

Olivine
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Opacifiers
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc. R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Overglaze Colors
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.

Oxides
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Palladium Decorations
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
The Hommel Co., O., Inc.

Pins
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
Louthan Mfg. Co.
Potters Supply Co.

Pins (Tile Setter)
Louthan Mfg. Co.

Placers (Concrete Pneumatic)
Ransome Concrete Machinery Co.

Placing Sand
United Clay Mines Co.

Platinum Decorations
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
The Hommel Co., O., Inc.

Polariscopes
Bausch & Lomb Optical Co.
Frazier-Simplex, Inc.

Porcelain Enameling Service (Practical)
American Rolling Mill Co.
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Porcelain Enamels
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Potters Wheels
Denver Fire Clay Co.

Potash (Carbonate)
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Solvay Sales Corp.
The Vitro Mfg. Co.

Producer Glass Plants
Frazier-Simplex, Inc.

Pug Mills
Lancaster Iron Works, Inc.

Pyrites (Natural Iron Sulphide)

The Hommel Co., O., Inc.

Pyrometer Tubes
Carborundum Co
Montgomery Porcelain Products Co.

Pyrometer Tubes (Refractory and Hard Porcelain)
Denver Fire Clay Co.
McDanel Refractory Porcelain Co.
Montgomery Porcelain Products Co.
Norton Co.

Pyrometers (Optical, Radiation, Surface, Immersion, Needle)
Pyrometer Instrument Co.

Pyrometric Cones
The Edward Orton, Jr., Ceramic Foundation

Racks, Firing (Refractory)
Louthan Mfg. Co.

Raw Material Handling Equipment
Frazier-Simplex, Inc.
Lancaster Iron Works, Inc.

Refractometers
Bausch & Lomb Optical Co.

Refractories
Carborundum Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Louthan Mfg. Co.
Norton Co.

Refractory Materials
Carborundum Co.
Chicago Vitreous Enamel Product Co.
Corhart Refractories Co.
Denver Fire Clay Co.
Louthan Mfg. Co.
Norton Co.
Titanium Alloy & Mfg. Co.

Respirators
Chicago Vitreous Enamel Product Co.
The DeVilbiss Co.
Drakenfeld, B. F., & Co.
The Hommel Co., O., Inc.
Willson Products, Inc.

Rutile
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal and Thermit Corp.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Saggers
Carborundum Co.
Norton Co.
Potters Supply Co.

Salt Cake
American Potash & Chemical Co.
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.

Sandblast Helmets
Willson Products, Inc.

Sand Grinder and Sifters
Lancaster Iron Works, Inc.

Saponin
The Hommel Co., O., Inc.

Screening and Magnetic Separators
National Engineering Co.

Selenite of Sodium
Drakenfeld, B. F., & Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Selenium
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Setters (Tableware)
Louthan Mfg. Co.

Sheaves (Tower)
Ransome Concrete Machinery Co.

Sheets (Enameling Iron)
American Rolling Mill Co.
Bethlehem Steel Co.

Silica (Fused)
The Hommel Co., O., Inc.

Silicate of Soda
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
The Hommel Co., O., Inc.
Harshaw Chemical Co.

Silicon Carbide
Carborundum Co.
Norton Co.

Silicon Carbide Firesand
Carborundum Co.

Sillimanite Refractories
Denver Fire Clay Co.

Slabs (Furnace)
Carborundum Co.
Norton Co.

Soda Ash
American Potash and Chemical Corp.
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.
The Vitro Mfg. Co.

Sodium Antimonate
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
The Vitro Mfg. Co.

Sodium Fluoride
Ceramic Color & Chemical Mfg. Co.
Denver Fire Clay Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Sodium Metasilicate
Harshaw Chemical Co.

Sodium Nitrite
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Sodium Silica Fluoride
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Sodium Uranate
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Soot Blowers
Frazier-Simplex, Inc.

Special Machines
Frazier-Simplex, Inc.

Spar
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Maxson, Elwyn L.
Paper Makers Importing Co.
The Vitro Mfg. Co.

Spray Booths
The DeVilbiss Co.
The Hommel Co., O., Inc.

Spraying Equipment
The DeVilbiss Co.
The Hommel Co., O., Inc.

Spurs
Louthan Mfg. Co.
Potters Supply Co.

Stacks
Lancaster Iron Works, Inc.

Steel Plate Construction
Bethlehem Steel Co.
Lancaster Iron Works, Inc.

Stilts
The Hommel Co., O., Inc.
Louthan Mfg. Co.
Potters Supply Co.

Sulfuric Acid
Denver Fire Clay Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Pennsylvania Salt Mfg. Co.

Talc
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.

Tanks
Frazier-Simplex, Inc.

Tank Blocks
Corhart Refractories Co.

Tanks (Pickle)
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.

Tanks for Raw Material Steel or Concrete
Bethlehem Steel Co.
Lancaster Iron Works, Inc.

Tile (Floor)
Norton Co.

Tile (Muffle)
Carborundum Co.
Norton Co.

Tile Setter Pins
Louthan Mfg. Co.

Tile (Refractory)
Carborundum Co. (*Carbofrax*)
Chicago Vitreous Enamel Product Co.
Denver Fire Clay Co.
Norton Co.

Tile (Wall)
Denver Fire Clay Co.

Tin Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
The Vitro Mfg. Co.

Titanium
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Titanium Oxide
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Towers (Concrete, Concrete Elevating, Steel Elevating)
Ransome Concrete Machinery Co.

Tri Sodium Phosphate
Harshaw Chemical Co.

Trucks
Lancaster Iron Works, Inc.

Tubes (Insulating)
Carborundum Co.
Louthan Mfg. Co.
McDanel Refractory Porcelain Co.
Norton Co.

Tubes (Pyrometer)
Carborundum Co.
Denver Fire Clay Co.
McDanel Refractory Porcelain Co.
Montgomery Porcelain Products Co.
Norton Co.

Uranium Oxide
Drakenfeld, B. F., & Co.
Harshaw Chemical Co.
The Hommel Co., O., Inc.

Uranium Oxide (Yellow-Orange-Black)
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Water Softening Plants
Frazier-Simplex, Inc.

Wet Enamel
Ceramic Color & Chemical Mfg. Co.
Chicago Vitreous Enamel Product Co.
The Hommel Co., O., Inc.
Porcelain Enamel and Mfg. Co.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Whiting
Ceramic Color & Chemical Mfg. Co.
Drakenfeld, B. F., & Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Paper Makers Importing Co.
The Vitro Mfg. Co.

Winding Drums
Lancaster Iron Works, Inc.

Zinc Oxide
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
The Vitro Mfg. Co.

Zircon
The Hommel Co., O., Inc.

Zirconia
Ceramic Color & Chemical Mfg. Co.
Du Pont de Nemours, E. I., & Co., Inc., R. & H. Chemicals Dept.
Harshaw Chemical Co.
The Hommel Co., O., Inc.
Metal & Thermit Corp.
Titanium Alloy & Mfg. Co.
The Vitro Mfg. Co.

Zirconium Oxide
The Hommel Co., O., Inc.

The Best West of the Rockies

- **POTTERY CLAYS**
  English and American
- **CERAMIC COLORS**
  Blythe Colour Works, Ltd.
- **SLABS...SETTERS...SAGGERS**
  Newcastle Refractories Co.
- **STANDARD PYROMETRIC CONES**
  Edward Orton, Jr., Ceramic Foundation
- **FRANTZ FERROFILTERS**

ELWYN L. MAXSON

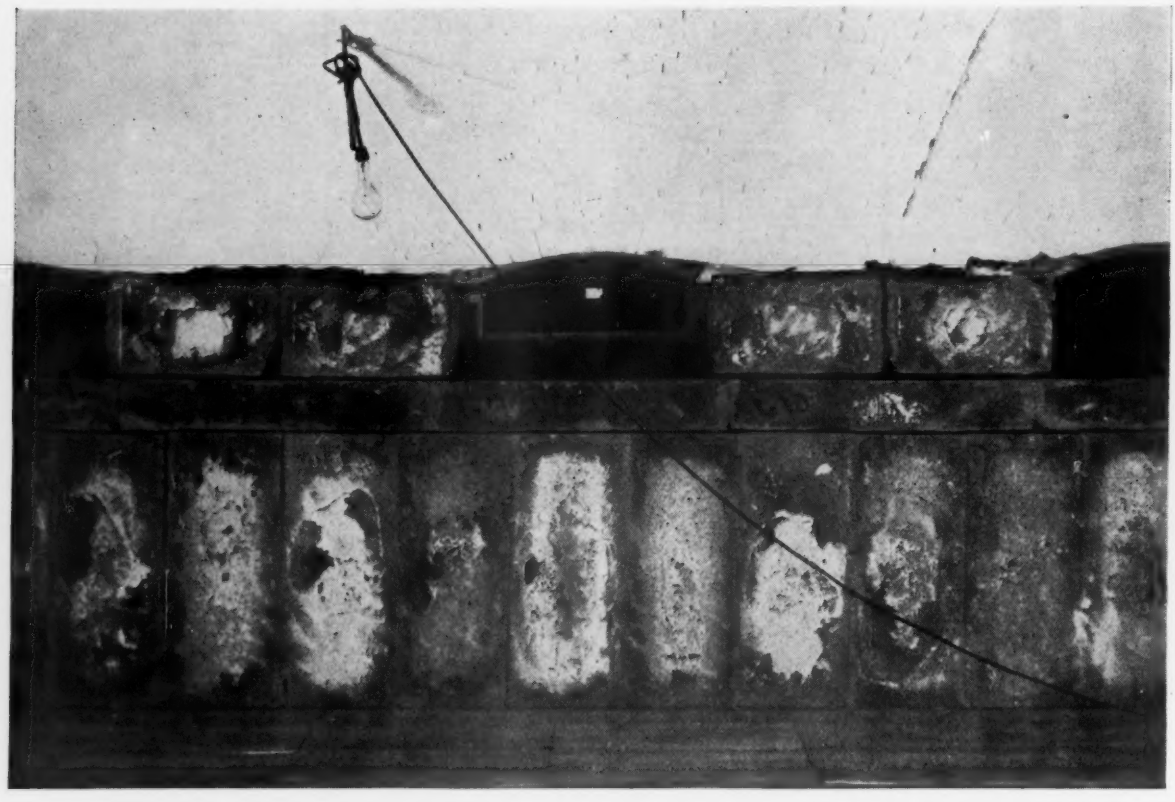
112 W. 9TH ST. *Ceramic Materials* LOS ANGELES

EASTON PAPER MAKERS IMPORTING CO. INC. EASTON, PENNSYLVANIA, U.S.A. PMIC INC

HIGHEST QUALITY
IMPORTED AND DOMESTIC
CLAYS
FLINT TALC
WHITING
PRECIPITATED CALCIUM CARBONATE

WHAT IS "THE PROPER AMOUNT" OF CORHART?

DURING the past ten years, the glass industry's conception of "the proper amount of Corhart" has changed considerably. A decade ago it was perhaps the throat. Today most of the industry considers it to be virtually the complete tank. . . . The photo below shows a simple and efficient application of Corhart both above and below the glass line. May we discuss with you the "proper amount of Corhart" for your tank? . . . *Address:* Corhart Refractories Co., *Incorporated*, 16th and Lee Sts., Louisville, Kentucky. *In Europe:* L'Electro Refractaire, Paris. *In Japan:* Asahi Glass Co., Tokio.



THE BULLETIN
OF THE AMERICAN CERAMIC SOCIETY

A Monthly Publication Devoted to Proceedings of the Society and Promotion of Coöperative Research of Technical, Scientific, and Art Questions

Volume 18 **MAY, 1939** **Number 5**

OFFICERS, TRUSTEES, AND COMMITTEES, 1939–1940

The *Bulletin* presents the photographs of the new officers and trustees of the American Ceramic Society. A. I. Andrews, Professor of Ceramic Engineering, University of Illinois, is President (for a biographical sketch of Dr. Andrews, see the *Bulletin*, **17** [2] 69 (1938)).

J. L. Carruthers, Professor of Ceramic Engineering, Ohio State University, is the Vice-President. A biographical sketch of Professor Carruthers was published in the *Bulletin*, **15** [3] 102 (1936).

Mr. Tefft was reëlected Treasurer of The Society for the term, 1939–1940 (Mr. Tefft's biography was published in the *Bulletin*, **15** [1] 18 (1936)).

The newly elected Trustees are H. B. DuBois, Materials and Equipment Division; A. F. Greaves-Walker, Structural Clay Products Division; and F. B. Ortman, Terra Cotta Division. Brief life sketches of Mr. DuBois and Mr. Ortman are presented on pages 160 and 161; that of Professor Greaves-Walker was published in the *Bulletin*, **17** [7] 299 (1938).

A. I. Andrews, President

HONORARY MEMBERS ELECTED, 1939

The Fellows of the American Ceramic Society, with the approval of the Board of Trustees of The Society, have elected two men to Honorary Membership in The Society.

Axel Samuel Wilhelm Odelberg, formerly president of the Gustafsberg China Works of Sweden.

Heinrich Ries, professor of geology, Cornell University, Ithaca, N. Y.

A biographical sketch of Dr. Ries and a complete bibliography of his writings were published in the *Bulletin*, **17** [12] 490 (1938). His photograph was used on the *Bulletin* cover of that issue.

Details of Dr. Oldelberg's life will be published in the June issue of the *Bulletin*.

John L. Carruthers, Vice-President

C. Forrest Tefft, Treasurer

FRED B. ORTMAN, TRUSTEE OF THE TERRA COTTA DIVISION

Fred Benson Ortman was born at New Salem, Ohio, January 5, 1888. He attended grade school in New Salem and in 1906 was graduated from North High School in Columbus, Ohio. During 1909–1910, he worked with the Alton Brick Co., Alton, Ill., as laborer, kiln burner, and foreman. In 1911, he was graduated from the Ohio State University with a degree of Ceramic Engineer.

From 1911–1917, inclusive, Mr. Ortman worked as assistant ceramist, chief ceramist, assistant general manager, and sales manager for the New York Architectural Terra Cotta Co., Long Island City, N. Y. He was chief ceramic engineer with the Northwestern Terra Cotta Company of Chicago from 1918 to 1920, inclusive. From 1921 through 1923, Mr. Ortman was vice-president and general manager of Tropico Potteries, Inc., Los Angeles, Calif. This Company was merged with Gladding, McBean, & Co. in 1923, and he was appointed vice-president of that Company and general manager of their southern California interests, which position he held until April, 1936, when he was elected executive vice-president and general manager of the Company's operations. In April, 1938, Mr. Ortman was elected president of the Company.

Mr. Ortman became a member of the American Ceramic Society in 1912 and served as vice-president of The Society during 1921; trustee during 1922, filling out the unexpired term of F. H. Riddle; and also trustee in 1923; Mr. Ortman was again elected trustee in 1939 and will serve for three years in this capacity. During 1918–1919, he was chairman of the Terra Cotta Division and in 1919, secretary of the Chicago Section, of The Society. He is a member of the Southern California Section of the American Ceramic Society.

Mr. Ortman is a director of the Pacific Finance Corp., Los Angeles Industries, Inc., and of the Consolidated Steel Corp., all of Los Angeles, and of the Merchants & Manufacturers Association, and Southern Californians, Inc., civic institutions of Los Angeles.

He is a member of the California Club and the Los Angeles Country Club of Los Angeles and of the Pacific Union Club of San Francisco.

Fred B. Ortman

FELLOWS INSTALLED AT THE FORTY-FIRST ANNUAL MEETING*

Harry William Thiemecke, Homer Laughlin China Co., Newell, W. Va.
Urban Emmett Bowes, Owens-Illinois Glass Co., Toledo, Ohio.
James Wilson Hepplewhite, Edwin M. Knowles China Co., Newell, W. Va.
Karl Ernest Peiler, Hartford-Empire Co., Hartford, Conn.
Chester Ronald Austin, Battelle Memorial Institute, Columbus, Ohio.
Helen Blair Barlett, A C Spark Plug Co., Flint, Mich.
John Daniel Sullivan, Battelle Memorial Institute, Columbus, Ohio.
Frank Edward Hodek, Jr., General Porcelain Enameling & Manufacturing Co., Chicago, Ill.
Vergil Mulholland, Hartford-Empire Co., Hartford, Conn.
Theodore Lenchner, Vitro Manufacturing Co., Corliss Station, Pittsburgh, Pa.

---

* The installation of Officers of The Society and of the Fellows preceded the Edward Orton, Jr., Memorial Address, Sunday evening, April 16, 1939.

A. F. Greaves-Walker, Trustee, Structural Clay Products Division

H. B. DUBOIS, TRUSTEE OF THE MATERIALS AND EQUIPMENT DIVISION

Hascall Burton DuBois was born April 18, 1901, in Central Square, N. Y. He attended grade school at Tully, N. Y., and Alfred, N. Y., and high school in Delhi, N. Y. In 1924, he was graduated from the New York State College of Ceramics, Alfred, N. Y., with the degree of Bachelor of Science; he also received the professional degree of ceramic engineer from the same school in 1938.

From September, 1924, to July, 1926, Mr. DuBois was ceramic engineer with the Standard Tile Co., Zanesville, Ohio. Here he organized a plant control system, developed a complete line of colored wall-tile glazes, and organized the colored glaze department. From July, 1926, to July, 1929, he was ceramic engineer and sales representative at the Pennsylvania Pulverizing Co., Lewistown, Pa., where he acted as adviser to the officials in matters pertaining to analyses of materials. From July, 1929, to the present time, Mr. DuBois has been ceramic engineer and sales representative for the Consolidated Feldspar Corp., Trenton, N. J. He has assisted in putting feldspar on the market with definite chemical compositions as well as an exacting control over grain size and fusion characteristics and has attempted to standardize fusion tests.[1]

[1] H. B. DuBois, "Proposed Method for Feldspar Fusion Trials," *Jour. Amer. Ceram. Soc.*, **15** [2] 144–48 (1932).

Mr. DuBois has been a member of the American Ceramic Society since 1923. He was chairman of the Materials and Equipment Division in 1936–1937. Before that period, he served as secretary and vice-chairman of the Division. In 1935, he was vice-chairman, and in 1936, chairman, of the Pittsburgh Section of the American Ceramic Society.

H. B. DuBois

MICHIGAN-NORTHWESTERN OHIO SECTION

The Michigan-Northwestern Ohio Section held the annual election of officers at its meeting on March 21 at the Hotel Meada in Mt. Clemens, Mich. The officers for 1939–1940 are as follows:

President: L. G. TAIT, Champion Spark Plug Co., Detroit, Mich.

Vice-President: R. O. LANE, Macklin Co., Jackson, Mich.

Councillor-at-Large: KARL SCHWARTZWALDER, A C Spark Plug Co., Flint, Mich.

Secretary-Treasurer: J. A. FOSTER, Ford Motor Co., Dearborn, Mich.

Larry Miller of the Miller Engineering Company, Swissvale, Pa., presented a talk on the condition of the ceramic industry in England and showed some excellent movies of mass production machines that his firm produces.

Thirty members attended the meeting.

—RICHARD O. LANE

CELO KYANITE
UNIFORM QUALITY DEPENDABLE SUPPLY
FOR INFORMATION AND SAMPLES WRITE TO
CELO MINES, INCORPORATED
BURNSVILLE, NORTH CAROLINA

THE AMERICAN CERAMIC SOCIETY TRUSTEES AND OFFICERS FOR 1939–1940

President: A. I. Andrews, University of Illinois, Urbana, Ill.
Vice-President: J. L. Carruthers, Ohio State University, Columbus, Ohio
Treasurer: C. Forrest Tefft, The Claycraft Co., Box 866, Columbus, Ohio
Secretary-Editor: R. C. Purdy, 2525 North High St., Columbus, Ohio
Past-President: V. V. Kelsey, Dominion Minerals, Inc., 719—15th St., N. W., Washington, D. C.
Past-President: R. B. Sosman, United States Steel Corp., Research Lab., Kearny, N. J.

TRUSTEES FROM INDUSTRIAL DIVISIONS*

Art: L. E. Barringer, General Electric Co., Schenectady, N. Y. (1940)
Enamel: H. G. Wolfram, Porcelain Enamel & Mfg. Co., Baltimore, Md. (1940)
Glass: D. E. Sharp, Hartford-Empire Co., Hartford, Conn. (1941)
Materials and Equipment: H. B. DuBois, Consolidated Feldspar Corp., Trenton, N. J. (1942)
Refractories: C. E. Bales, Ironton Fire Brick Co., Ironton, Ohio (1940)
Structural Clay Products: A. F. Greaves-Walker, Univ. of North Carolina, Raleigh, N. C. (1942)
Terra Cotta: F. B. Ortman, Gladding, McBean, & Co., Los Angeles, Calif. (1942)
White Wares: E. H. Fritz, Westinghouse Electric & Mfg. Co., Derry, Pa. (1941)
Institute of Ceramic Engineers: R. E. Birch, Harbison-Walker Refractories Co., Pittsburgh, Pa. (1941)
Ceramic Educational Council: A. S. Watts, Dept. of Ceramic Engineering, Ohio State Univ., Columbus, Ohio (1941)

* Date of expiration of term of office in parentheses.

DIVISION OFFICERS

Art
Chairman: Paul E. Cox, Iowa State College, Ames, Iowa
Secretary: C. C. Engle, United Clay Mines Corp., Trenton, N. J.

Enamel
Chairman: W. H. Pfeiffer, Frigidaire Div., General Motors, Eng. Lab., Dayton, Ohio
Secretary: D. G. Bennett, Mellon Institute, Pittsburgh, Pa.

Glass
Chairman: N. W. Taylor, Pennsylvania State College, State College, Pa.
Secretary: S. R. Scholes, N. Y. State College of Ceramics, Alfred, N. Y.

Materials and Equipment
Chairman: William Malkin, B. F. Drakenfeld & Co., Inc., East Liverpool, Ohio
Secretary: W. H. Emerson, Homer Laughlin China Co., Newell, W. Va.

Refractories
Chairman: S. F. Walton, Exolon Co., Blasdell, N. Y.
Secretary: Gilbert Soler, Steel & Tube Div., Timken Roller Bearing Co., Canton, Ohio

Structural Clay Products
Chairman: C. R. Austin, Battelle Memorial Institute, Columbus, Ohio
Secretary: J. H. Isenhour, Isenhour Brick Co., Salisbury, N. C.

Terra Cotta
Chairman: H. E. Davis, Federal Seaboard Terra Cotta Co., South Amboy, N. J.
Secretary: D. F. Albery, Charleston Vitreous Clay Products Co., Charleston, W. Va.

White Wares
Chairman: Karl Schwartzwalder, AC Spark Plug Co., Flint, Mich.
Secretary: Harry Thiemecke, Homer Laughlin China Co., Newell, West Va.

OFFICERS OF THE FELLOWS

Dean: S. R. Scholes, New York State College of Ceramics, Alfred, N. Y.
Associate Dean: Edward Schramm, Onondaga Pottery Co., Syracuse, N. Y.
Secretary-Treasurer: T. N. McVay, University of Alabama, University, Ala.

LOCAL SECTIONS

Baltimore-Washington
Chairman: G. R. Shelton, National Bureau of Standards, Washington, D. C.
Secretary: Donald Hubbard, National Bureau of Standards, Washington, D. C.

Central Ohio
Chairman: W. C. Rueckel, Battelle Memorial Institute, Columbus, Ohio
Secretary: G. H. Duncombe, Jr., Battelle Memorial Institute, Columbus, Ohio

Chicago
President: A. L. Vodicka, Aetna Porcelain Enameling Co., Chicago, Ill.
Secretary: Rexford Newcomb, Jr., Industrial Publications, Inc., Chicago, Ill.

Michigan-Northwestern Ohio
Chairman: L. G. Tait, Champion Spark Plug Co., Detroit, Mich.
Secretary: J. A. Foster, Ford Motor Co., Dearborn, Mich.

Northern California
Chairman: A. S. Adcock, American Radiator & Standard Sanitary Co., Richmond, Calif.
Secretary: G. A. Page, Stockton Fire Brick Co., Pittsburg, Calif.

Pacific-Northwest
President: F. G. Burrows, Chehalis Brick & Tile Co., Chehalis, Wash.
Secretary: Hewitt Wilson, Univ. of Washington, Seattle, Wash.

Pittsburgh
Chairman: Ernest Hommel, O. Hommel Co., Pittsburgh, Pa.
Secretary: C. L. Thompson, Harbison-Walker Refractories Co., Pittsburgh, Pa.

Southern California
Chairman: H. R. Goodrich, Gladding, McBean, & Co., Los Angeles, Calif.
Secretary: J. G. Stewart, Braun Corp., Los Angeles, Calif.

St. Louis
Chairman: H. M. Tostlebe, General Refractories Co., Clayton, Mo.
Secretary: P. G. Herold, Missouri School of Mines, Rolla, Mo.

COMMITTEE ON PUBLICATIONS

Chairman: J. D. Sullivan, Battelle Memorial Institute, Columbus, Ohio
A. N. Finn, National Bureau of Standards, Washington, D. C.
E. E. Marbaker, Mellon Institute, Pittsburgh, Pa.
W. W. Winship, Thermal Syndicate, New York, N. Y.
R. C. Purdy, 2525 North High St., Columbus, Ohio
Editorial and Advertising Offices:
The American Ceramic Society, 2525 North High Street, Columbus, Ohio

OFFICIAL PERSONNEL OF DIVISIONS, 1939–1940

	Art	Enamel	Glass	Materials and Equipment	Refractories	Structural Clay Products	Terra Cotta	White Wares
Trustee	L. E. Barringer	H. G. Wolfram	D. E. Sharp	H. B. DuBois	C. E. Bales	A. F. Greaves-Walker	F. B. Ortman	E. H. Fritz
Chairman	Paul E. Cox	W. H. Pfeiffer	N. W. Taylor	William Malkin	S. F. Walton	C. R. Austin	H. E. Davis	K. Schwartzwalder
Vice-Chairman	J. P. Thorley		W. R. Lester	B. T. Bonnot	J. B. Austin	H. Z. Schofield		
2nd Vice-Chairman	Theodore Lenchner		A. K. Lyle					
Secretary	C. C. Engle	D. G Bennett	S. R. Scholes	W. H. Emerson	Gilbert Soler	J. H. Isenhour	D. F. Albery	Harry Thiemecke
Society Nominations A.....	Carlton Atherton	B. A. Rice	W. M. Clark	R. B. Carothers	R. K. Hursh	E. W. Knapp	H. D. Callahan	F. P. Hall
Society Nominations B.....	H. E. Marley	G. H. McIntyre	J. T. Littleton	J. E. Eagle	L. J. Trostel	J. E. Rankin	R. L. Clare	J. R. Beam
Division Nominations		W. N. Harrison	A. N. Finn U. E. Bowes					
Papers and Program	W. A. Weldon E. de F. Curtis	J. D. Tetrick	W. R. Lester A. K. Lyle	F. E. Finch	R. S. Bradley G. S. Diamond	H. R. Straight H. Z. Schofield L. R. Whitaker	H. E. Davis D. F. Albery	R. Russell, Jr. F. C. Henderson J. R. Kauffman
Membership	K. E. Smith		J. T. Ogden		C. A. Freeman	J. H. Stewart J. F. Grady	J. L. Carruthers	Hewitt Wilson
Standards	K. E. Smith	C. R. Amberg	G. W. Morey		S. M. Swain E. H. Van Schoick	H. C. Plummer		J. H. Koenig
Research	C. M. Harder		W. Weyl		D. W. Ross	R. B. Keplinger		L. H. Brown
Data	E. de F. Curtis		A. E. Badger		C. L. Thompson	H. G. Schurecht	E. E. Marbaker	H. C. Harrison
Rules	W. A. Weldon E. de F. Curtis	G. H. Spencer-Strong	A. N. Finn		K. E. Buck	G. H. Duncombe, Jr.		A. M. Hossenlopp
Councillors	Myrtle M. French E. de F. Curtis	F. R. Porter G. H. Spencer-Strong	F. C. Flint E. W. Tillotson			T. W. Garve F. M. Butterworth		F. P. Hall
Exhibitions	Anna Lane Dixon	*Bibliography* J. E. Rosenberg	R. M. Curts					W. E. Palmer

The Official Personnel of Divisions will appear each month on the outside back cover of the *Journal*. The Trustees and Officers of The Society and Division and Local Section Officers are published each month on the back of the Table of Contents of the *Journal*.

ON THE UP AND UP

PAID MEMBERSHIP RECORD

Date of Record	Members Paid		Deferred	Subscriptions	Monthly Sales	Total Circulation
	Personal	Corporation				
December 20, 1936	1452	196				
December 22, 1937	1713	220	12	523	220	2688
December 19, 1938	1815	222	26	589	220	2872
January 21, 1939	1792	220	26	610	220	2868
February 18, 1939	1795	225	25	620	220	2885
March 30, 1939	1808	229	23	648	220	2929
April 18, 1939	1641	226	58	596	220	2741

In spite of resignations and nonpayments, our paid membership total is up—EIGHT Personal and TWENTY-ONE Corporations—over that of one year ago. Since completion of this table, TWENTY-THREE Personal and ONE Corporation have paid their dues. The Roster Increase of Paid Members therefore is actually—

THIRTY-ONE PERSONAL and TWENTY-TWO CORPORATIONS

NEW MEMBERS

Corporation

BRAUN CORPORATION, J. G. Stewart (voter), 2260 E. 15th St., Los Angeles, Calif.

*TITANIUM ALLOY MFG. CO., C. J. Kinzie (voter), Drawer D, Niagara Falls, N. Y.

YOUNGSTOWN ARC ENGRAVING CO., W. J. Gutknecht (voter), Vindicator Bldg., Youngstown, Ohio.

Personal

BABCOCK, CLARENCE L., 2610 Calverton Rd., Toledo, Ohio; research physicist, Owens-Illinois Glass Co.

BAKER, JOSEPH, Roberts & Mander Stove Co., Hatboro, Pa.; enamel plant superintendent.

BOND, J. W. G., Pike Bros, Ltd., Wareham, Dorsetshire, England.

CAMPBELL, TOM W., Box 255, Poland, Ohio; sales representative, Electro Refractories & Alloys Corp., Buffalo, N. Y.

*Indicates former member of The Society rejoining.

*CAPPER, A. M., Continental Roll & Steel Foundry Co., Coraopolis, Pa.

COLE, WILLIAM G., JR., 629 Wellington, Ottawa, Ontario, Canada; plant superintendent, Ferro Enamels (Canada), Ltd.

COWMAN, MERRILL G., 1062 Morse St., San José, Calif.; ceramic engineer, Garden City Pottery.

DAVIES, CHESTER A., Y.M.C.A., Trenton, N. J.; ceramist, Standard Sanitary Mfg. Co.

DEVOL, MANSON L., Mellon Institute, Pittsburgh, Pa.; industrial fellow.

DIENER, ALBERT J., 511 Broad St., Dunkirk, Ind.; chemical engineer, Hart Glass Mfg. Co.

DOTY, HENRY S., Phosphate Recovery Corp., 61 Broadway, New York, N. Y.; chemist.

HESS, R. JONES, 309 S. Centre St., Philipsburg, Pa.; engineer of mines, General Refractories Co.

HUTCHISON, R. C., 613 Fourth Ave., Bethlehem, Pa.; refractories engineer, Bethlehem Steel Co.

KREIDL, Ekkehard, Ceramic Dept., Pennsylvania State College, State College, Pa.

KREIDL, NORBERT J., Dunkirk Glass Works, Dunkirk, N. Y.

LATIMER, HORACE L., 939 Copeman Blvd., Flint, Mich.; ceramic engineer, AC Spark Plug Co.
*LUTTON, X. W., 122 Palmer Ave., Collingswood, N. J.; manager, Camden Pottery.
MACHATTIE, IAN J. W., 41 Highcroft Rd., Toronto, Ontario, Canada; research fellow, Ontario Research Foundation.
MOFFAT, JOHN, JR., 3001 California St., Huntington Park, Calif.; superintendent, Tillotson Clay Products Co.
RANKIN, JAMES J., St. Joseph Lead Co., Josephtown, Pa.; production engineer.
SHORT, ALBERT P., 401 North Broad St., Philadelphia, Pa.; sales representative, Charles Taylor Sons Co., Cincinnati, Ohio.
SILVERMAN, WILLIAM B., 2268 Putnam St., Toledo, Ohio; Owens-Illinois Glass Co.
SIMONSEN, VICTOR G., Ceramica São Caetano S.A., Caixa Postal 278, São Paulo, Brazil, South America; technical inspector.
STEPHENSON, HEBER H., 112 Columbia St., Jackson, Ohio; president, Lawrence Clay Co.
STRANGE, JOHN M., Fort Hays Kansas State College, Hays, Kansas; professor.
TRIMBLE, LEE S., Macon Chamber of Commerce, Box 288, Macon, Ga.; vice-president.
*WATTS, H. L., Dept. of Mines, Industrial Minerals Div., Ottawa, Ontario, Canada.
WEINHEIMER, EDWARD F., 22450 Law Ave., Dearborn, Mich.; Great Lakes Steel Corp.

Student

Georgia School of Technology: R. ELDRIDGE CAMP, HAROLD DYE, AND DORROH L. NOWELL, JR.
University of Illinois: JOHN W. BRISCOE.
New York State College of Ceramics: FRANK A. PARK, JR., AND ROBERT W. RIX.
University of North Carolina: GILBERT C. ROBINSON.
Pennsylvania State College: MELLEN A. KNIGHT AND LELAND B. MCCLURE.

MEMBERSHIP WORKERS' RECORD

Corporation

C. H. Commons, Jr.	1	F. H. Rhead	1
Hobert R. Goodrich	1		

Personal

C. E. Bales	2	A. de A. Pereira	1
M. C. Booze	1	John F. Quirk	1
R. F. Brenner	1	G. E. Sievert	1
W. P. DerMott	1	R. B. Sosman	1
A. F. Greaves-Walker	1	A. E. R. Westman	1
E. C. Greenstreet	1	W. Weyl	2
J. W. Hepplewhite	1	H. E. White	1
H. H. Holscher	2	B. E. Whitesell	1
H. M. Kraner	1	Office	7
P. G. Larkin	1		

Student

A. I. Andrews	1	Lane Mitchell	3
R. M. Campbell	2	R. L. Stone	1
E. C. Henry	1	W. Weyl	1
		Grand Total	40

ROSTER CHANGES DURING MARCH AND APRIL*

Corporation

CENTRAL SILICA CO., E. M. Ayers (voter), Zanesville, Ohio (Glenford, Ohio)
INTERNATIONAL SMELTING & REFINING CO., W. M. Weathers (voter), Akron, Ohio (East Chicago, Ind.)
RAMTITE CO., Theodore Kauffman, Jr. (voter), 2563 W. 18th St., Chicago, Ill. (formerly in name of Theodore Kauffman, Jr., personal member)

Personal

BENNETT, MYLES P., 714 N. Oak Ave., Temple City, Calif. (Alhambra, Calif.)
BLAKE, A. E., 51 Ravine Ave., Caldwell, N. J. (Essex Fells, N. J.)
BOYLE, STANLEY H., 821 Payne Ave., Dunbar, W. Va. (Lima, Ohio)
CAMPBELL, G. DONALD, 620 Locust St., Clarksburg, W. Va. (Tarentum, Pa.)
EARLY, JOSEPH, Phoenix Glass Co., Monaca, Pa. (Pittsburgh, Pa.)
EBRIGHT, H. E., Chicago Vitreous Enamel Product Co., Cicero, Ill. (Lakewood, Ohio)
FOOTE, E. H., JR., Box 602, Athens, Tex. (Medina, Ohio)
GROTHUSEN, RALPH H., Sheffield, Iowa (St. Joseph, Mo.)
HOUSER, VICTOR F., 4118 E. 58th St., Maywood, Calif. (Atlanta, Ga.)
HUNT, JOHN F., 2207 S. West Ave., Jackson, Mich. (Niagara Falls, N. Y.)
JACKSON, ARTHUR W., Acme Brick Co., Malvern, Ark. (Dallas, Tex.)
KING, JOHN U., JR., 195 N. Union St., Concord, N. C. (Wilmington, N. C.)
LICHTENSTERN, FRANZ, Tivoli 10, Brno, Czechoslovakia (formerly in name of Kurt Lichtenstern)
MANSON, M. E., Washington-Eljer Co., 4300 S. Alameda Ave., Los Angeles, Calif. (Milwaukee, Wis.)
MAUPIN, ADDISON, General Refractories Co., Olive Hill, Ky. (Philadelphia, Pa.)
MCCLEISH, LELAND J., 418 N. Main St., Benton, Ill. (Owensboro, Ky.)
MCLAREN, HENRY D., Ferro Enamels, Ltd., Wombourne, Wolverhampton, England (Ottawa, Ont., Canada)
MINTON, LEWIS G., The Chesterfield, 21 Harris St., N. W., Atlanta, Ga. (Seville, Ohio)
NAPIER, J. B., 328 Hill Crest Ave., Macon, Ga. (Atlanta, Ga.)
PARRY, WILLIAM, 45, Fourth Ave., Heaton, Bolton, England (Paisley, Scotland)
PIERCE, JAMES B., JR., Barium Reduction Corp., South Charleston, W. Va. (Huntington, W. Va.)
SADA, ROBERTO G., Troqueles y Esmaltes, Apartado 371, Monterrey, N. L., Mexico (formerly in name of Camilo G. Sada)
SANTOMIERI, S. LEWIS, 43 Linden Ave., East Rochester, N. Y. (Victor, N. Y.)
SIEGRIST, PAUL F., Evens & Howard Sewer Pipe Co., 5200 Manchester Ave., St. Louis, Mo. (Alcoa, Tenn.)
STAPLEFORD, GEORGE H., 983 S. Broad St., Trenton, N. J. (East Liverpool, Ohio)
TATE, FRANK E., Limoges-Sebring Associates, Sebring, Ohio (Mt. Clemens, Mich.)
WATTERS, C. R., 550 Virginia Ave., Bucyrus, Ohio (Alliance, Ohio)
WHITAKER, LORENZO R., Richland Shale Products Co., Richtex, S. C. (Columbia, S. C.)
WHITE, R. H., Abrasive Co. of Canada, Ltd., Arvida, Quebec, Canada (Philadelphia, Pa.)
ZINSZER, WILLIAM K., Ames Art Pottery Co., Ames, Iowa (Hays, Kans.)

Student

CICHOWSKI, VAL J., 196 Curtis St., New Britain, Conn. (Champaign, Ill.)
DORAN, ROBERT, 439 Washington St., St. Marys, Pa. (State College, Pa.)
LULL, STANLEY E., 31 W. Frambes Ave., Columbus, Ohio (Westfield, N. Y.)
TURNBULL, JOHN E., 42 E. Frambes Ave., Columbus, Ohio (Ironton, Ohio)

* Address in parentheses is the former address.

CERAMIC EXHIBIT IN MINES BUILDING*

The Ceramic Exhibit is displayed in four windows under the "mountain" constructed in the Mines Building. These windows are part of a series which show iron, brass, copper, silver, etc., products. The windows have been divided into structural clay, art, historic, and industrial products related to ceramics.

(1) Structural Clay Products Window

The structural clay products window (see Fig. 1) shows a background of pictures of typical buildings in the face of which are small lights indicating different products; on the side wall is a list of these products also with small lights, and on the steps are specimens of these products and the lights are wired up to flash simultaneously so as to tie together the name, use, and product.

(2) Art Products Window

The art products window (see Fig. 2) is set up in more elegant style with carpeted floor and mirrors in the background. Commercial pottery and private studio products are included. The commercial potteries participating are Vernon, Metlox, Pacific, Wallace, and Gladding, McBean, & Co.

(3) Historic Products Window

The background of the historic exhibit (see Fig. 3) was done by Mr. Stecatti of the Oakland College of Arts and Crafts, the benches are by E. E. Saunders of Gladding, McBean, & Co.; these, incidentally, are made of a plank used for some time for sewer-pipe unloading at Gladding, McBean, & Co. The grog floor is by the American Radiator & Standard Sanitary Co., Richmond, Calif. The big piece in the middle was made in Stockton in 1893 and was presented to Emery Smith at the Midwinter International Exposition at Golden Gate Park in 1894; it has been outdoors in his garden ever since. Most of the pieces on the benches are by Mr. Robertson and were made at Vallejo and Oakland in coöperation with Mrs. Irelan, the wife of the first State Geologist; these go back to 1886. The small vase in the foreground is by Mr. Robertson's son, and the modern parallelogram piece, also in the foreground, is by the third generation of Robertsons. The roof tile is one of the original tile from the Carmel Mission, and the pipe, which dates back to 1775, was used at one of the missions.

(4) Industrial Products Window

The industrial products exhibit (see Fig. 4) was supervised by Ernest Goodner, University of Washington ceramic graduate and now with the Standard Oil Co. This is a fine display of industrial ceramic products, and the background of enlarged industrial scenes creates the proper atmosphere.

(5) Sponsors of the Ceramic Exhibit

In spite of the limitation in space, the shortage of funds, and the fact that the writer was Chairman of the Committee, the display is one that demonstrates the diversity and fine quality of ceramic products on the Coast.

Among the companies outside of California contributing financial support to this Exhibit are Washington Brick & Lime Co., Spokane, Wash.; Idaho Fire Brick & Clay Co., Troy, Idaho; Lewistown Brick & Tile Co., Lewis-

* For Advance Program Announcement, see April *Bulletin*, p. 150.

Fig. 1.—Structural Clay Products Exhibit.

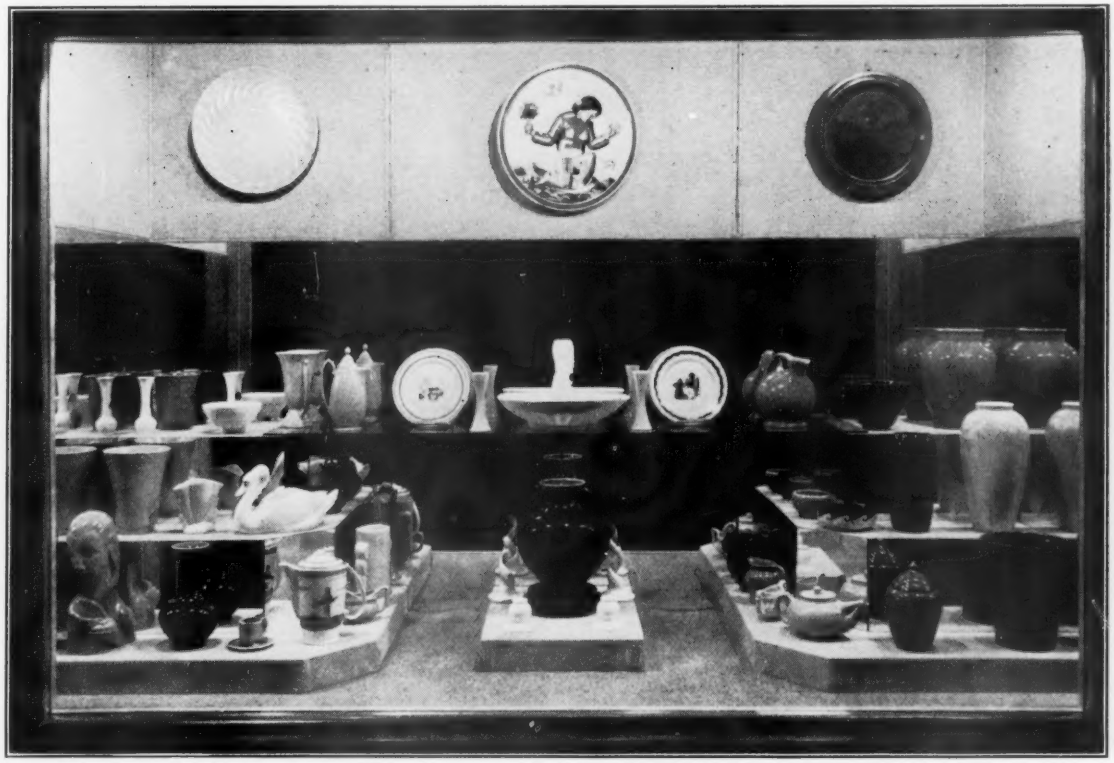


Fig. 2.—Art Products Exhibit.

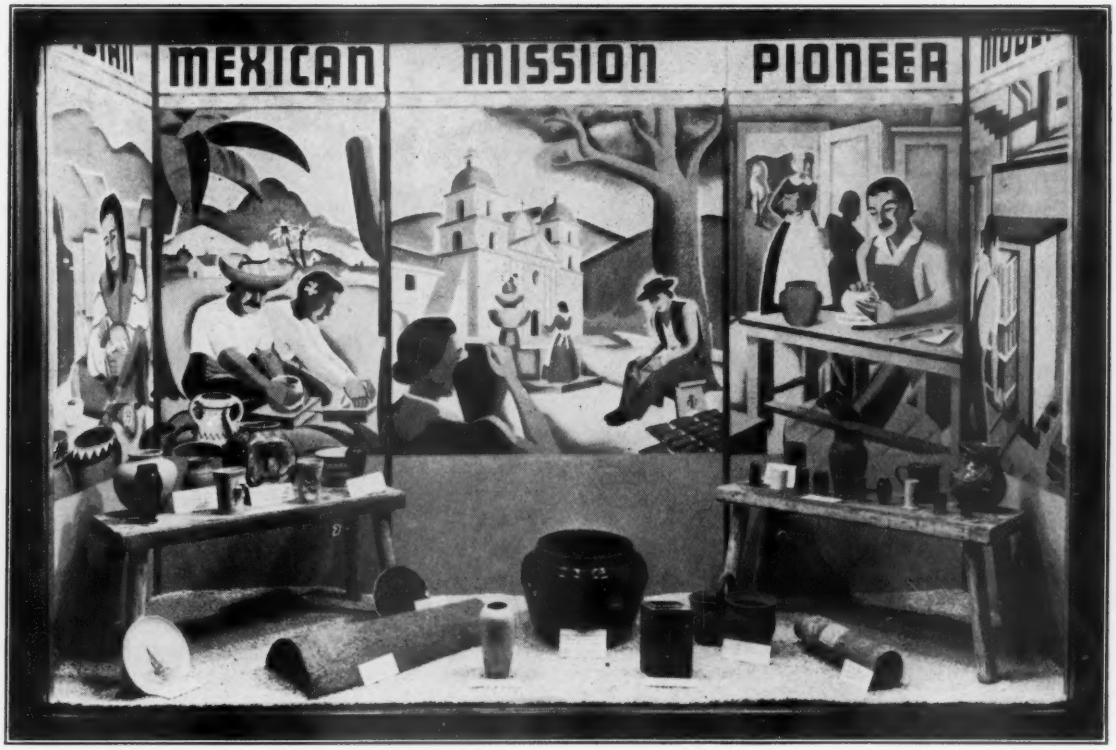


Fig. 3.—Historic Products Exhibit.

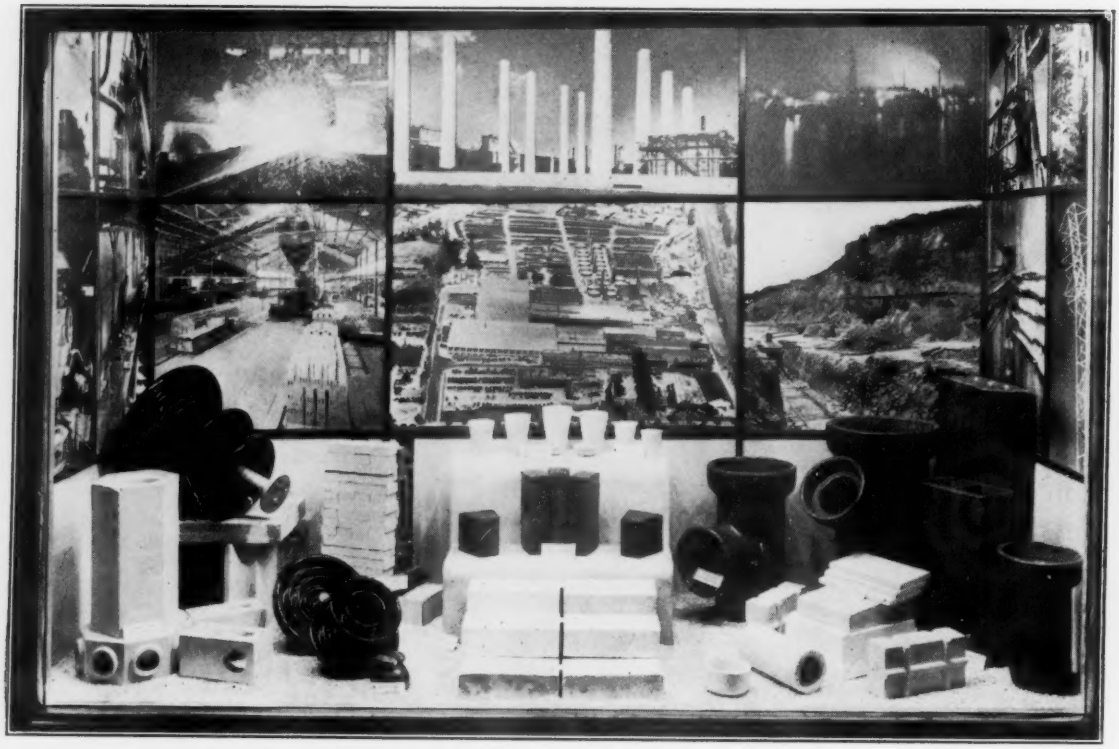


Fig. 4.—Industrial Products Exhibit.

town, Mont.; Interstate Brick Co., Salt Lake City, Utah; Utah Fire Clay Co., Salt Lake City, Utah; Coors Porcelain Co., Denver, Colo.; and Columbia Brick Works, Portland, Ore.

The pottery exhibit of Gladding, McBean, & Co., the only one of its kind on the floors, is shown in Fig. 5.

The glass companies have fine exhibits, and Du Pont is featuring ceramics in connection with its department supplying glaze materials, etc. —E. E. SAUNDERS

CERAMIC DECORATIVE ARTS DISPLAY

The tone of the Decorative Arts Exhibit is modern, bringing together the world's top ranking artists, designers, craftsmen, and manufacturers. More specifically, it is a blend of the functional and the fantastic. The Exhibit has achieved the midway line between the two and blends the starkness of the functional with imagination, color, and gaiety, characteristic of fantasy.

The major emphasis of the Decorative Arts Show is upon craft and handmade objects, but machine-made products have their place in the Exhibit.

Thirteen completely furnished rooms, four terraces, a collage by the San Francisco women artists, three ateliers, and exhibits of ceramics, modern enamels, costume design, furniture, glass, lace, liturgical art, jewels, wallpaper, silver, sculpture, textiles, fabrics, rugs, bookbinding and book illustration, and other special exhibits, in coördinated arrangements, comprise the Decorative Arts Show at the World's Fair of the West.

Three workshops, dropped a little below the level on which spectators stand looking down into them, are devoted to three important crafts, fundamentally different in technique, *viz.*, bookbinding, ceramics, and weaving. All three, continuing ancient traditions, have found appropriate contemporary forms, and in a modern world of machine production, they maintain their importance.

Although glassmaking is an ancient art, and most of the techniques used today have been known for centuries, the form and decoration of the various types are characterized by so definite a style that they have the stamp of "modern." Simplicity, dignity, delight in material, are common denominators of the contemporary age of glass.

This Exhibit at the Golden Gate Exposition gives recognition to the importance of glass in the modern era by showing the work of recognized masters in the art of glassmaking.

Represented in the Show are Alvar Aalto, Josef Albers, Marianna Von Allesch, Samuel Ayres, Compagnie des Cristalleries de Baccarat, Alberta Baker, Vetreria Artistica Barovier, Elis Bergh, Lucienne Block, Mario Codognato, Charles J. Connick, A. D. Copier, Ewald Dahlskog, Daum Freres, François Decorchement, Grattan English, Ferro Toso-Barovier Vetrerie Artistiche Riunite S. A., Simon Gaté, John M. Gates, Hope Gladding, Edward Hald, Maurice Heaton, Walter Heintze, Holmegaard, Karhula Factory, Kosta-Reijmyre Factory, Rene Lalique, Nils Landberg, N. V. Glasfabriek "Leerdam," Vic r Linstrand, J. & L. Lobmeyr, Jean Luce, Glen Lukens, Tyra Lundgren, Louis Marcoussis, Maurice Marinot, James McNaughton, Helen Myers, Henri Navarre, Edwin Ohrstrom, Orrefors Bruks Aktiebolag, Palmquist, Barnaby Powell, James Powell & Sons, Donald Russell, George Sakier, Carlo Scarpa, Jacques Schnier, Steuben Glass, Inc., Stevens-Williams Ltd., Edward Stromberg, George Thompson, Dorothy Thorpe, Paolo Venini, Vetri Soffiati Muranesi Venini & Co., Sidney Waugh, and Whitefriars.

POINTS OF INTEREST NEAR SAN FRANCISCO

(1) *Treasure Island:* Man-made site of the Golden Gate International Exposition of 1939, on San Francisco Bay, largest island ever built by man (reached by ferry and San Francisco-Oakland Bay Bridge).

(2) *East Bay Cities:* Oakland, important business and manufacturing center; Berkeley, site of the University of California; Alameda; the Oakland Skyline Boulevard drive is one not to miss (reached via San Francisco-Oakland Bay Bridge and ferry boats).

Fig. 5.—Gladding, McBean, & Co. Pottery Display.

(3) *"Marvelous" Marin County:* Peaceful country towns, separated from busy San Francisco only by the Bay; Sausalito; San Rafael; Muir Woods, forest of giant redwood trees; Mount Tamalpais; U. S. Army air base at Hamilton Field (reached via Golden Gate Bridge).

(4) *Napa County:* Vineyards and orchards; wineries; Mt. St. Helena and Mt. Veeder, extinct volcanoes; colorful valleys and mountains (north via Golden Gate Bridge).

(5) *Sonoma County:* Russian River and its pleasant resorts; Jack London's home and Valley of the Moon; petrified redwood forest; mineral springs; Luther Burbank's home and experimental gardens (north via Golden Gate Bridge).

(6) *San Mateo County:* Beautiful residential cities; Burlingame; San Mateo; Redwood City; numerous lakes; ocean shore playgrounds (south from San Francisco, down the Peninsula).

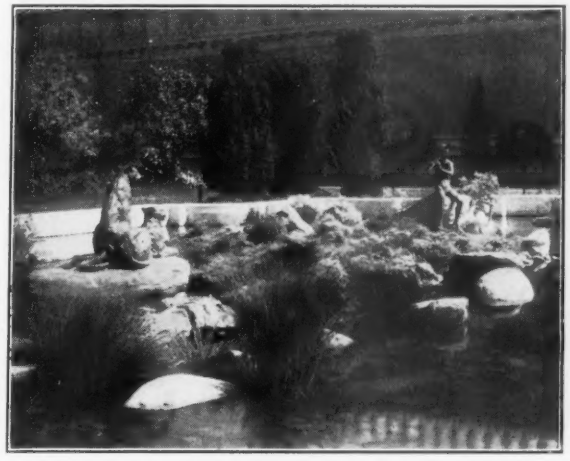
(7) *Palo Alto:* Palo Alto, south of San Mateo, site of Leland Stanford University; conspicuous among the group of distinguished buildings on the Stanford campus is the Memorial Church, costing $1,700,000.

(8) *Santa Cruz:* Famous surf-bathing resort (reached via Los Gatos on a drive that runs through giant redwoods).

(9) *Monterey Peninsula:* This region, including Monterey, Carmel-by-the-Sea, Pebble Beach, Del Monte, 17-Mile Drive, is fittingly termed the "Circle of Enchantment"; the home of many famed artists and writers.

(10) *Sacramento:* Truly memorable is a trip to California's capital, Sacramento, from San Francisco through the lands of the rich Sacramento Valley; from Sacramento the visitor plunges quickly into the heart of the Mother Lode Country and Bret Harte-Mark Twain regions. Historic Fort Sutter with a museum of early relics is part of the Sacramento Centennial.

(11) *National Parks:* For those who wish to go farther afield to view some of the unforgettable points of interest near San Francisco, and yet remain within a day's jaunt of the city, there are the four great national parks in the Sierra Nevada Mountains, to the east, Yosemite, Sequoia, General Grant, and Lassen.



Pool of Enchantment, Golden Gate International Exposition

(12) *Yosemite:* Alive with waterfalls, which cascade down its valley from the Merced River; one of these falls is 2325 feet high, the highest in the world; the park also contains three groves of sequoia, the celebrated "big trees of California."

(13) *Sequoia:* Second oldest of our National Parks;

the General Sherman Tree, oldest and largest living thing (36.5 feet in diameter and 279.9 feet in height) and Mount Whitney, highest mountain in the United States (14,469 feet).

(14) *General Grant Park:* Called the little neighbor of Sequoia; thousands of giant sequoia trees glorify its confines; the new Generals' Highway joins the two parks.

(15) *Lassen Volcanic National Park:* Spreads out around 10,453-foot high Mount Lassen, the only active volcano in continental United States; boiling lakes, lava fields, many accessible volcanic cones, and other phenomena await the explorations of the visitor.

Treasure Island, Golden Gate International Exposition

SAN FRANCISCO HOTEL RATES

	Single	Double	Twin	No. Rooms
Class A Hotels				
Clift: Geary at Taylor	$4.00 to $ 7.00	$6.00 to $10.00	$7.00 to $10.00	551
Fairmont: 950 Mason St.	4.00 to 8.00	6.00 to 9.00	7.00 to 12.00	530
Mark Hopkins: 999 California St.	5.00 to 8.00	7.00 to 12.00	8.00 to 12.00	450
Palace: Market & New Montgomery	4.00 to 7.00	6.00 to 8.00	7.00 to 10.00	551
St. Francis: Powell & Geary Sts.	4.00 to 10.00	6.00 to 10.00	7.00 to 12.00	1000
Sir Francis Drake: Sutter & Powell Sts.	4.00 to 6.00	6.00 to 8.00	7.00 to 9.00	600
Class B Hotels				
Alexander Hamilton: 631 O'Farrell St.	3.00 to 6.00	4.50 to 7.00	5.00 to 8.00	250
Bellevue: Geary & Taylor Sts.	3.00 to 4.00	4.50 to 5.00	5.00 to 6.00	300
Californian: 405 Taylor St.	3.00 to 3.50	4.50 to 5.00	5.00 to 6.00	300
Canterbury: 750 Sutter St.	3.00 to 4.00	4.50 to 5.00	5.00 to 6.00	250
Chancellor: 433 Powell St.	3.00 to 6.00	4.50 to 7.00	5.00 to 8.00	150
Drake-Wiltshire: 340 Stockton St.	3.00 to 4.00	4.00 to 5.00	5.00 to 7.00	250
El Cortez: 550 Geary St.	3.00 to 5.00	4.50 to 6.00	5.00 to 8.00	200
Embassy: 610 Polk St.	2.50 to 3.00	3.00 to 4.00	4.00 to 5.00	90
Empire: 100 McAllister St.	3.50 to 6.00	5.00 to 8.00	6.00 to 9.00	500
Gaylord: 620 Jones St.	3.00 to 4.00	4.50 to 5.00	5.00 to 6.00	200
Manx: 225 Powell St.	3.00 to 4.00	4.50 to 6.00	5.00 to 7.00	300
Maurice: 761 Post St.	3.00 to 4.00	4.50 to 5.00	5.00 to 6.00	200
Olympic: 230 Eddy St.	3.00 to 5.00	4.50 to 6.00	5.00 to 7.00	250
Pickwick: Fifth & Mission Sts.	3.00	4.00	4.50	200
Plaza: Post & Stockton Sts.	3.00 to 6.00	4.50 to 7.00	5.00 to 8.00	300
Stewart: 353 Geary St.	3.00 to 4.00	4.50 to 6.00	5.00 to 7.00	350
Whitcomb: 1231 Market St.	3.00 to 4.00	4.00 to 6.00	5.00 to 7.00	500

Monday, August 7, is officially designated as Ceramic Day with Atholl McBean as speaker at the Ceramic Dinner on Treasure Island

CERAMIC SCHOOL NOTES

FOURTH ANNUAL CLAY PRODUCTS PLANT OPERATORS' CONFERENCE

University of Illinois

The Clay Products Plant Operators' Conference will be held at the University of Illinois at Urbana on Friday and Saturday, May 26 and 27. These annual meetings and programs are arranged by the Department of Ceramic Engineering in coöperation with the Illinois Clay Manufacturers' Association.

It is the purpose of the Conference to present a program of papers and discussions on subjects of direct concern to those who are responsible for production in plants manufacturing structural clay products and refractories. Such topics as drying, firing, dies, grinding, etc., are presented by men whose experience will bring new ideas and new viewpoints to those who deal with operation problems in the plant.

Opportunity is provided for general discussions in which exchanges of experiences are an aid to those who encounter similar difficulties. There are often a number of ways to solve a problem, but some may be better than others, and the better methods often develop in such discussions.

The Conference is the outgrowth of the "Short Course for Clay Workers," which was conducted for many years by the Department of Ceramic Engineering. No fee is charged for attendance and anyone who is interested is invited to attend.

ULTRA HIGH-SPEED PHOTOGRAPHIC STUDY OF GLASS FRACTURING

Ultra high-speed photographs revealing the fact that glass cracks at the rate of nearly a mile a second have led to the establishment at the Massachusetts Institute of Technology of a $3000 Fellowship for further photographic studies, which are expected to point the way to improvements in the quality of glass through new knowledge of the behavior of the material during the brief moment of fracture.

Frederick E. Barstow of Midland, Michigan, as the recipient of the Fellowship, will continue his research work which led to his degree of Master of Science in the Department of Physics at M.I.T. The program will be supervised by Harold E. Edgerton, who is well known for the development of methods of high-speed photography which have permitted making accurately timed exposures.

Some preliminary experiments on fracturing glass were made last year by Professor Edgerton, and an extension of these studies, suggested by the Hartford-Empire Company, has led to establishment of the Fellowship, which is being donated by the following six glass manufacturing companies, each contributing a share to the fund: Owens-Illinois Glass Co., Hartford-Empire Co., Pittsburgh Plate Glass Co., Hazel-Atlas Glass Co., Libbey-Owens-Ford Glass Co., and Corning Glass Works.

Already Barstow's work has included the taking of pictures of shattering plates of glass with camera exposures of less than a millionth of a second. These pictures "stop" the action of a splintering piece of glass and reveal the complicated and symmetrical pattern at various stages in the process. The results check similar experiments by German scientists who have been breaking glass with bullets.

To the scientist, glass presents a peculiar riddle, because it is actually stronger than steel under normal conditions of compression. These studies on the brittle nature of glass are being carried out in order to discover just why and how glass breaks when a shock is applied.

RUTGERS UNIVERSITY

D. D. Wheeler, Titanium Alloy Mfg. Co., New York, N. Y., was guest speaker at a meeting of the Rutgers Ceramic Club and the Ceramic Association of New Jersey on April 4 at Rutgers University, New Brunswick, N. J.

Mr. Wheeler's topic was "Use of Zirconium and Titanium Compounds in the Ceramic and Allied Industries." He described the physical characteristics of the zirconium and titanium compounds commonly used in industry, *viz.*, the oxides, silicates, and double silicates, and an enumeration of their uses. Chief among these are their use as opacifying agents to impart (1) valuable properties, such as hardness, craze resistance, and gloss to glazes, (2) hardness, opacity, and light weight to porcelain enamels, and (3) refractoriness and spalling resistance to bodies. Various miscellaneous uses of compounds of these elements in other than the ceramic industries were discussed. A brief colloquium followed Mr. Wheeler's lecture.

The meeting was attended by students and faculty of the Department of Ceramics and representatives of ceramic industries in New Jersey and neighboring states.

—GILBERT GOODMAN, *Recording Secretary*

KERAMOS OHIO STATE CHAPTER

The Ohio State Chapter of Keramos held its annual pledge banquet in Columbus, Ohio, on April 11. The guests of honor, who will soon become members of Keramos, were John Schuck, James Blackwood, Alfred Robinson, Harry Papier, Donald Postlewaite, J. Ted McQuaide, and Max Muller. Before the pledging ceremony, Professors Watts, Carruthers, and King discussed the benefits of belonging to Keramos.

There has been such a demand among ceramic men for the recently published "Abstracts on Colors and Glazes," that it was decided in the meeting to mimeograph 50 more copies. These abstracts consist of 36 pages and contain the complete abstracts of glazes and colors from the *Transactions of the American Ceramic Society*. They are available to all ceramic men for $1.00.

The Project Committee made a report on the progress of the new Whitewares Bibliography, which has been prepared from the 19 volumes of the *Transactions*. There are approximately 140 pages. This volume has been completed and is available to all cermic men for $2.00.

Initiation for the new pledges will be held on May 17 at the Fort Hayes Hotel.

—W. D. SPORE, *Vice-President*

MISSOURI SCHOOL OF MINES

The Student Branch held its regular meeting March 8, 1939. Two of the senior students in Ceramic Engineering told of their experiences at work in industry. Albert Tetley described his work at a refractories brick plant in Mexico, Mo., during the summer, and Stuart Dods gave a step-by-step description of the manufacture of wall tile as used by a company in California. He explained how pictures are drawn on the tile and fired. Professor Dodd concluded the meeting by showing slides of different methods of stacking ware on cars in preparation for drying and firing, discussing the relative merits of each method.

At a preceding meeting, officers for 1939–1940 were elected as follows: WILLIAM SMOTHERS, *President;* JOE HOFFMAN, *Vice-President;* and IVAN NIEDLING, *Secretary-Treasurer.*

The retiring officers are ALBERT TETLEY, *President;* SIDNEY PEER, *Vice-President;* and TED PLANJE, *Secretary-Treasurer.*

—IVAN NIEDLING, *Secretary*

GEORGIA SCHOOL OF TECHNOLOGY ANNUAL REPORT

Since the last Annual Report of the Georgia Tech Student Branch, there have been many activities sponsored by this organization. On May 14, 1938, the Branch was chartered at a banquet attended by Ross C. Purdy, General Secretary, and Emerson P. Poste, Past-President of the American Ceramic Society. Mrs. Purdy also honored the group with her presence.

Although the Georgia Tech Student Branch had functioned off and on for ten years, no charter had ever been granted. The Charter as finally received contained names of the original members as well as those of the reorganizing group. Dr. Purdy and Mr. Poste gave inspirational talks to the assemblage, after which the entire party moved over to the second Ceramic Carnival, sponsored in the Ceramic Engineering Building. Ceramic processes were demonstrated, carnival games were played, refreshments were served, and souvenirs were given away.

Many of the students were employed in ceramic industries during the summer months.

Election of officers for the 1938–1939 school year took place at the opening of the fall semester: EMORY W. CLARK, *President;* HAROLD DYE, *Vice-President;* LEON NUNES, *Secretary;* and HOLT B. GRACE, *Treasurer.*

The Branch held a special meeting to welcome sophomores and new students. The faculty members, A. V. Henry, W. H. Vaughan, and Lane Mitchell, greeted the students with short talks. A wiener roast and picnic supper was held in the kiln room, and the new members were initiated with appropriate campus ceremony.

Speakers at meetings during the fall included E. B. Flowers, Warren Co., who spoke on "Enamels"; and J. B. Cheshire, Johns-Manville Co., whose subject was "Insulation"; he also showed a moving picture, "Heat." Arthur Parker, of the same Company, returned at a later date and showed another film on the manufacture of "Transite." A color film showing art activities of the Cranbrook Academy of Art, including ceramics, was shown at a recent meeting and was discussed by Julian Harris, sculptor, now connected with the Ceramic Engineering Department of Georgia Tech. F. H. Rayfield, of Potter-Rayfield Co., spoke on "Faults in Enamel Tanks" at a recent meeting.

A hay ride was held during the fall, culminating in a wiener roast and picnic at the home of L. A. Tedder in Smyrna, Ga. In March, a square dance and steak fry was held at Monroe Gardens in Atlanta.

Several plants were visited, *viz.*, the Chattahoochee Brick Co.; the Warren Co., enamelers; the Atlantic Refractories Co.; Carling Tile Co.; Dalton Brick & Tile Co.; B. Mifflin Hood Co., roofing tile manufacturers; and the Georgia Kaolin Co.

Plans are now being made for the third annual Ceramic Carnival, to be held in May, 1939, when a new addition to the Ceramic Engineering Building will be dedicated.

Most of the senior students are planning to attend the Annual Meeting of the American Ceramic Society in Chicago.

—LANE MITCHELL, *Councillor*

OHIO STATE UNIVERSITY

On April 5, 1939, James M. Plumer, University of Michigan, Ann Arbor, Mich., presented two illustrated lectures under the auspices of the Ohio State University Student Branch of the American Ceramic Society. Dr. Plumer is an outstanding American authority on Chinese art.

In the afternoon, Dr. Plumer talked on "The Tools of the Chinese Pottery," which he illustrated with a special display of Chinese pottery equipment. In the evening, his subject was "A Trip to Sung Temmoku or Chien Kiln-Site Where the Famous 'Partridge Feather' or 'Hare-Fur Tea Bowls' Were Made."

HAROLD CHARLES HARRISON

Two of the contributors to the Program of the Forty-First Annual Meeting were Harold C. Harrison. In this notice, we are introducing to our members Harold Charles Harrison.

Harold C. Harrison is assistant professor in chemistry at the New York State College of Ceramics. He was born at Rutland, Vt., February 10, 1907. He was graduated from the Staunton Military Academy in June, 1926, and in June, 1931, received a B.S. degree from Washington and Lee University.

Harold Charles Harrison

From September, 1933, to June, 1936, Professor Harrison was assistant in chemistry at Cornell University, and he received a Ph.D. degree in chemistry from Cornell in September, 1938.

He is a member of Alpha Chi Sigma, Gamma Sigma Epsilon, AlDjebar, and Keramos.

He has been affiliated with the Chemistry Department of the New York State College of Ceramics since 1936.

UNIVERSITY OF NORTH CAROLINA, RALEIGH BRANCH

The Student Branch of the University of North Carolina, Raleigh Branch, entertained V. V. Kelsey, President of the American Ceramic Society, on March 7, 1939.

A dinner was given in honor of Mr. Kelsey at the Carolina Hotel, and the regular meeting of the Student Branch was held at the college. Mr. Kelsey made a fine speech on industry and industrial problems in which he emphasized education and a positive or optimistic approach to such problems. He also discussed new developments, particularly that of a new type of glass bottle.

—J. N. SMITH, *Secretary*

REPORT OF THE COMMITTEE ON CERAMIC EDUCATION*

The By-Laws of the American Ceramic Society adopted by the Board of Trustees (published in *Bull. Amer. Ceram. Soc.*, **17** [10] 390 (1938)) under Article B XII, Committees, paragraph (10), give the status of the Committee on Ceramic Education.

The Committee on Ceramic Education was organized in its present form in 1937. The first chairman after the reorganization was A. F. Greaves-Walker. The members of the Committee are appointed to serve for five years, except that initially to assure continuity of policy they were appointed for the following terms: educator, one year; industrialist, two years; technologist, three years; artist, four years; and engineer, five years. The Chairman of this General Committee is to be its eldest member or the one whose term has one year to run.

At the Fortieth Annual Meeting in New Orleans, the representatives of the education committees of the various units coöperating or affiliating with the American Ceramic Society agreed upon the following specific activities for the various committees.

The Fellows Committee planned to make an analysis in graduate activities and to outline suggested future activities in graduate work in the various ceramic schools.

The Ceramic Educational Council Committee was to continue the studies of the undergraduate curricula in the various ceramic schools with the ultimate purpose of developing a standardized curriculum for ceramic engineering and any other technical ceramic courses.

The Committee on Education of the Institute of Ceramic Engineers was to coöperate with departments of ceramic engineering and the Ceramic Educational Council in an effort to improve the training of students in the departments of ceramic engineering in order that they might meet the requirements of industry and the State Boards of Engineering Examiners. They planned, furthermore, to make a survey of the reactions of the ceramic industry toward the education of recent ceramic graduates and their fitness for work.

According to the Rules of the Institute, the contact with the E.C.P.D. is no longer a function of the Education Committee inasmuch as the Committee to Coöperate with the Engineer's Council for Professional Development will serve in this capacity. All of the activity in connection with accrediting those schools which have not yet received E.C.P.D. approval is to be handled by this Committee.

Nothing was suggested at this meeting as an activity for the parent Society Committee, nor during the year has the Board of Trustees requested this Committee to act in an advisory capacity.

The Institute of Ceramic Engineers has done a splendid piece of work in its study of ceramic engineering education and in its contacts with the Engineer's Council for Professional Development. The Chairman of the Institute's Committee of Education, in accordance with the By-Laws, is *ex-officio* one of the members of the present general Committee.

The parent Society Committee planned to study ceramic technology education and ceramic art education as the other two large classes of the Society in order to work out an educational program comparable to the ceramic engineers. N. W. Taylor was appointed Chairman of the Subcommittee on Ceramic Technology Education and F. H. Rhead, Chairman of the Subcommittee on Ceramic Art Education; the other members of the Subcommittees were to be selected by their Chairmen.

The Subcommittee on Ceramic Technology Education has purposely delayed its report pending the gathering of data by the various schools for the Ceramic Educational Council. Dr. Taylor, as a member of both groups, is able to coördinate the work of these two units and plans to carry on this study.

The Subcommittee on Ceramic Art Education reports that any program dealing with education in ceramic art must give consideration to two distinct fields, *viz.*, craft ceramics (fine art ceramics), and industrial ceramics. Mr. Rhead has been assembling data for the past five years, chiefly concerned with courses dealing with ceramic decorative processes, shape construction, and ceramic design, and has also been studying an experimental course planned in conjunction with the local ceramic art school which is now an extension class of the University of West Virginia. He hopes to present some data later this year for the consideration of the Committee and others interested in this subject.

N. W. Taylor automatically becomes Chairman of the General Committee on Education, representing the ceramic technologists, with F. H. Rhead representing the artists; E. H. Fritz, the engineers; C. M. Dodd, the educators; and a new member is to be appointed representing the industrialists.

One point of possible conflict has arisen in that the representative of the ceramic engineers is supposed to be the Chairman of the Committee on Education of the Institute of Ceramic Engineers. The purpose in the five-year term was to have continuity of action, and it is suggested to the officers of the Institute of Ceramic Engineers that the term of Chairman of the Committee on Education be made to coincide with the term of office of their member on the general Committee.

A conference of the representatives of all the education committees working on ceramic education in its various forms, similar to the meeting held in New Orleans, has been called for the Chicago meeting.

Respectfully submitted by the Committee on Ceramic Education: H. E. White, *Chairman;* N. W. Taylor, F. H. Rhead, E. H. Fritz, C. M. Dodd

* Submitted March 27, 1939.

NECROLOGY

ROBERT JOHN REES

Word has been received of the death of Robert John Rees, Corning Glass Works, Corning, New York.

Mr. Rees was born in Niles, Ohio, May 22, 1888, the son of David Rees and Mary Evans Rees, who were born in Wales. When quite young, Mr. Rees went to live in Girard, Ohio, where he received his early education in the public schools. Always a good reader and of a studious nature, he thought he would like journalism or newspaper editing. As a result, he took up his studies while working for a newspaper in Youngstown before he was sixteen years old. Because of the death of his father, he was compelled to help support his mother and a family of eight.

At the age of twenty-one, Mr. Rees went into the Civil Service and worked in the Youngstown, Ohio, post office as a clerk. He then decided on an engineering course through correspondence with the University of Chicago, which he continued for years.

In 1915, he became associated with the Oakwood China Co. in East Liverpool, Ohio. He gained much of his experience in that line of work and was deeply interested in his work.

In January, 1918, Mr. Rees left for Central Falls, R. I., to become affiliated with the Central Falls Division of the General Electric Co. Under the general manager, E. C. Cross of Cleveland, Ohio, he turned his attention to making bulbs and continued working his way until he became manager of the Company after it was sold to Corning Glass Works. Except for the three years between November, 1918, and July, 1921, he was with the Pitney Glass Works in Cleveland, having been sent there by Mr. Cross when that plant was being organized. He returned to Rhode Island in July, 1921. In November, 1921, he spent several months in a hospital, but he never fully regained his health.

In 1933, Mr. Rees went to Corning Glass Works, Corning, N. Y.; he became manager of Fallbrook and later

went to Wellsboro, N. Y. During all of this time he supervised the Rhode Island factory.

Mr. Rees is survived by his widow; one son, Edward C. Rees, who is now with the General Electric Co. in Nela Park; and two daughters.

Robert John Rees

He was one of the most capable men in the Corning Glass Works organization and was very generally liked. In spite of the fact that for the last seventeen years he was seriously afflicted physically, hardly any one was aware of this, because he kept his troubles so much to himself. He was in general charge of the bulb and tubing factories during the past several years.

Mr. Rees had been a member of the American Ceramic Society since November, 1928.

JOHN L. GREEN

John Leigh Green, aged sixty-five, president of Laclede-Christy Clay Products Co., died at his home in St. Louis on March 5, 1939. He was the son of the late James Green, furnace builder and founder of Laclede Fire Brick Manufacturing Company, which in 1907 merged with the Christy Fire Clay Company.

John L. Green entered the services of the organization in 1900 after his graduation from Princeton University and following his apprentice years with the Helmbacher Forge and Rolling Mill Company of which his father was president. This company was later sold to the American Car and Foundry Company.

Mr. Green became president of Laclede-Christy Clay Products Company in 1911, and his father, among whose accomplishments was the dry-press process of firebrick manufacture, remained as Board Chairman until his death in 1914.

To John L. Green is ascribed the origin of Laclede-Christy's research department, the first to be established by any manufacturer of refractories. Perpetuating the high ideals of the founder, whose efforts had attained national prominence for the Company in the development of refractories capable of meeting the needs of steel, glass, zinc, and numerous other industries, he carried on to greater heights the scientific investigations which have been responsible for the development of many important refractory products and processes, among which was the super-refractory or high alumina refractory.

Mr. Green's special interests centered on research with particular emphasis on nonmetallic minerals and high alumina clays. His activity in these fields accounts for the Company's ranking position in the glass refractories industry and in the production of high-temperature specialties.

Mr. Green has been succeeded in the presidency by W. J. Westphalen, former vice-president and general manager.

GEORGE A. BALZ

George Adam Balz died suddenly at his home on February 23, 1939, in Elizabeth, N. J. He was fifty-four years old. Mr. Balz received the degree of Mechanical Engineer from Stevens Institute of Technology. He held the following positions: cadet engineer, Western Electric Co., New York; assistant superintendent, Astoria Light, Heat, & Power Co., New York; successively, superintendent of construction, contracting engineer, and assistant general manager of the former Didier-March Co.; president, Seaboard Refractories Co., Perth Amboy, N. J. (for the last eighteen years).

George A. Balz

Mr. Balz was well known in the ceramic industry, where he was regarded as a foremost authority on refractories.

He was a member of the American Refractories Institute, the American Ceramic Society (since 1917), the Ceramic Association of New Jersey, the Special Refractories Association, and the American Society of Mechanical Engineers.

Mr. Balz had been inactive for about two years, suffering from a heart ailment.

NOTES

P. P. BUDNIKOFF

P. P. Budnikoff has recently been elected member of the U.S.S.R. Academy of Sciences (Ukraine) and corresponding member of the U.S.S.R. Academy of Sciences. Professor Budnikoff is leading the chair of Silicate Technology of the Kharkov Institute of Chemical Technology and is on the Technology Faculty of the same Institute. He is active in scientific research work, especially in the field of refractories and binding materials.

Professor Budnikoff is an abstracter for *Ceramic Abstracts*, has contributed to the technical literature in the Society publications, and has been a member of The Society since 1924.

P. P. Budnikoff

DR. SILVERMAN HONORED ABROAD

Alexander Silverman, head of the Department of Chemistry, University of Pittsburgh, has been elected a member of the Association Scientifique and Technique de Céramique of France.

P. ORVIN IS NOT A MEMBER OF THE AMERICAN CERAMIC SOCIETY

P. Orvin, who has been in Washington during the past month or two, apparently makes it a point to contact men in the clay products or ceramic field and obtain small loans.

He claims to be a ceramic engineer belonging to the American Ceramic Society and the local organization at Los Angeles, Calif.

One of our friends has been a victim of Mr. Orvin and has asked if we would attempt to find his mailing address and verify his membership in your Society. It is with this in mind that we write you.

Any information you may have will be appreciated.

—Henry C. Plummer, *Chief Engineer, Structural Clay Products Institute, Washington, D. C.*

American Refractories Institute Technical Advisory Committee

Reading left to right (seated): J. M. McKinley, L. J. Trostel, F. A. Harvey, R. S. Bradley, L. C. Hewitt; *(standing)* C. E. Bales, M. C. Booze, E. H. Van Schoick, S. M. Phelps.

THE NEW HIGH-TEST SAFETY GLASS*

High-test safety glass is made by pressing a sheet of a newly perfected transparent plastic, known as "polyvinyl acetal resin," between two layers of thin plate glass. This "sandwich" construction has been used since laminated safety glass was first introduced commercially for autos in 1924. There had been a period during the World War when safety glass was put to special uses.

The difference between the new safety glass and types previously made lies in the new plastic and the use of thinner layers of plate glass, making possible a laminated glass no thicker than ordinary plate glass.

The new plastic and glass is available to all manufacturers of automobiles, buses, and other carriers at no increase in cost over previous safety glasses. It will be produced in sufficient quantities to be available for 75% of cars made in 1939.

The safety features are (1) great penetration resistance at all temperatures; (2) no deterioration or discoloration from sunlight or moisture; (3) extreme flexibility when broken under impact lessens danger of concussions and fractures; (4) comparative ease in cutting for replacement work; (5) perfect visibility achieved through development of plate glass in thin panes; (6) shatter-resistance quality at low temperatures.

At normal temperatures, the high-test glass is about twice as "strong" (*i.e.*, resistant to impact) as previous types; at zero, five or six times as strong. Because of its unusual bendability when broken, a passenger trapped in a car may force the new glass out of its frame with less chance of injury.

* See "Franklin Institute Honors Safety-Glass Development," April *Bulletin*, p. 153.

Glass Rolls Up Like A Rug

The amazing cohesion of the glass and plastic "sandwich" in the new high-test safety plate glass is illustrated. Miss Wynette Price has rolled up "like a rug" a large pane of the new glass which had been broken by hammer blows. Three chemical and two glass companies were honored by the Institute for their six years of research at a cost of $6,000,000 spent in developing the new super-safe product.

Brief History of Safety Glass

The first patent on laminated safety glass was issued to John Crewe Wood, an Englishman, in 1906. Edouard Benedictus, a Frenchman, "discovered" the lamination principle in 1903 when he dropped a collodion-lined flask and noticed that the fragments of glass clung to the "plastic" lining, so that the flask star-cracked but did not shatter.

When "closed" cars supplanted open types, about 1923, the need for a safety glass became imperative. More than half the persons injured in auto accidents were cut by glass. About 1924, experimental installations were made, and the glass then cost from $10 to $12 a square foot. Safety plate glass for windshields appeared as original equipment on several makes in 1928, and by 1934 safety plate "all around" was standard equipment.

Improvements since 1928

The first safety glass was made with a filler of cellulose nitrate that discolored and deteriorated. Some of these faults were overcome by adding actinic-ray filtering materials to the glass and by sealing the edges. The next plastic was cellulose acetate (about 1930), which produced safety glass satisfactory to the majority of motorists. Scientists recognized need for improvement to produce glass of greater resilience through use of thinner panes and a filler which would not become brittle at low temperatures. Their efforts culminated after six years in the new high-test safety plate glass.

Super-Safety Glass Makes Formal Debut

W. Chattin Wetherill, *center*, vice-president, Franklin Institute, wields a hammer to demonstrate super-shatter-resistance of new high-test safety plate glass at Philadelphia, Pa., March 31, 1939. *Left to right:* H. S. Wherrett, president, Pittsburgh Plate; Henry Butler Allen, director, Franklin Institute; Stewart McDonald, Federal Housing Administrator; John D. Biggers, president, Libbey-Owens-Ford; A. E. Pitcher, Du Pont; Dr. Wetherill; Edward R. Weidlein, director of Mellon Institute; John C. Brooks, vice-president, Monsanto Chemical; George O. Curme, vice-president, Carbide and Carbon; and Paul G. Hoffman, president, Automotive Safety Foundation.

ALL-MIRROR WALL, GLASS MURALS IN CHICAGO RESTAURANT

A restaurant in which a completely mirrored wall "doubles" the apparent size of the generous room and in which the gathering of food from the four corners of the world is depicted in inlaid glass murals on the opposite wall is located at 64 West Madison St., Chicago, Ill.

This eating place (the Forum Cafeteria) caters to office workers, and part of its function is to provide an agreeable change of atmosphere from shop and office. Mirrors and structural glass were chosen as the prime decorative materials with the further thought of avoiding "dating" through association with any passing architectural style.

Glass Produces Optical Illusions

One of the most extraordinary of the optical illusions produced by the use of mirror and structural glass is the effect, wherein a "half-round" ceiling light of translucent vitrolux, installed flush against the all-mirror left wall, is doubled and becomes, in effect, a huge complete circle. Reflected in the mirror is the opposite wall made entirely of jade agate vitrolite with unique murals composed of inlaid opaque and tinted mirror glass, depicting scenes of the gathering of food products in various parts of the world. The stairways to the balcony on either side are paneled with plate glass bearing a simple etched design.

Decorative Panel of Glass Inlay

One of the mural panels depicts a fishing scene on the Grand Banks. It is entirely of inlaid pieces of thin colored glass and tinted mirrors against a background of jade agate vitrolite. The painstaking work of the designer and of the glass industry have combined to bring out with vivid realism the natural colors of the scene.

Decorative Panel of Glass Inlay

One of a series of eleven glass panels made of thin pieces of colored opaque glass and tinted mirrors. Practically the entire interior of the restaurant is of glass. Three walls are sun-tan and cadet blue vitrolite and the fourth is covered with polished plate-glass mirrors over its entire 120-foot length.

ROUTINE SAMPLING ATMOSPHERE IMPURITIES

A definite answer to the question, "How clean is the air where your men work?" may be found in a bulletin issued by the Air Hygiene Foundation. Air impurities cause much of the illness among heavy industry's 15 million workers.

The bulletin, "Routine Sampling for Control of Atmospheric Impurities," was prepared by the Foundation's Preventive Engineering Committee, headed by Philip Drinker of Harvard. It lists proved methods of collection, determination, and apparatus for checking forty-five dangerous substances commonly found in industrial atmospheres, such as ammonia, arsenic dust, benzene, chromic acid, carbon dioxide, hydrocarbons, lead dust or fume, mercury, methanol, sulfur dioxide, etc.

Two steps involved in checking the air of a workplace are measurement of air currents and the estimation of impurities. The resulting data may then be applied to the design of control equipment or to checking the results brought about by such equipment.

Procedures for high- and low-air velocity operations are recommended, and for the purpose of selecting sampling and control methods in relation to exhaust systems in plants or mines, several distinct types of atmospheric impurities must be considered, such as (*a*) relatively insoluble mineral dusts (silica, many silicates, and fly ash); (*b*) relatively soluble mineral dusts, like calcite (limestone); (*c*) finely divided fume substances that are difficult to

catch in water (lead, lead oxide, and zinc oxide); (*d*) dusts that may be affected by water (flour, leather, and soap); many of these dusts are explosive if mixed with air; (*e*) aqueous mists (chromic acid entrained from electroplating baths or condensate from vats of various sorts); (*f*) water-soluble gases (hydrochloric acid); such soluble gases usually contain mist as well as gas, the proportions depending upon local conditions; and (*g*) gases or organic vapors (benzene) soluble with difficulty; these react slowly with most liquids but may be adsorbed readily by solids, such as activated carbon.

The impinger is commonly used in sampling dusts and occasionally in mists and some gases. It is definitely unsuited to certain other gases like chlorine or organic vapors. It is not efficient against finely divided fume substances, such as lead or zinc oxide, and it is rarely suited to sampling organic dusts.

For sampling finely divided fume substances, like lead, a small electric precipitator gives accurate results. Barnes and Penney of Westinghouse Electric & Mfg. Co., have described a small precipitator which should be well adapted to field use and is now available. The various grab-sampling instruments give useful indications of changes in dustiness but do not imitate the impinger in any way, so that it is impossible to convert impinger to grab-sample counts.

Most explosive dusts are affected by water, while some of them, especially organic dusts, *e.g.*, flour, are difficult to wet. Explosive concentrations of all such dusts are very high as compared with dust concentrations of hygienic significance so that explosive dusts are determined by weight rather than count.

Dust Analysis and Gas Sampling Methods

In the case of all dusts, the estimation of the sample taken from the air may be made by counting representative fractions under the microscope, the sample may be analyzed by appropriate chemical methods, or the material may be weighed. The large impinger and the electric precipitator are equally well adapted to either procedure. The midget impinger collects, in reasonable sampling time, a relatively small amount of dust, but enough for counting. Dusts, like silica, that are troublesome to determine chemically are generally counted; those like lead, manganese, and cadmium are determined chemically.

For routine control work of light-field *vs.* dark-field counting, the relative advantages of these two methods, no matter what sampling instrument is used, are relatively unimportant.

Some gases and vapors in minute amounts, notably carbon monoxide, hydrogen sulfide, and mercury, give strong chemical reactions which make possible rapid estimations and, still better, continuous records of pollution. The bulk of gases and vapors from organic solvents, *e.g.*, benzene, carbon tetrachloride, and carbon disulfide, however, can not be caught efficiently unless sampled at slow rates, such as $^1/_2$ to 1 liter per minute. Some of them, such as benzene, can be absorbed directly in special solvents or adsorbents, like charcoal or silica gel, or can be converted into another compound which can then be estimated by an appropriate method.

The greatest difficulty in estimating organic vapors in air occurs when mixtures of vapors are present, which unfortunately is all too often the case. The devising of short cuts in itself also offers a major problem, but local conditions sometimes permit the approximations of the proportions of the several ingredients in the collected sample and calculation of the total by estimating only the most easily determined single constituent.

Routine Checks and Recording of Air Impurities

If control equipment has been installed, samples should be taken periodically for check-ups as to whether the equipment is functioning as it should. If concentrations obviously are high, it is usually a waste of time to take the sample and to estimate it. Many plants operate crushing units and other dust producers at night to take advantage of reduced power rates and to stagger employment over twenty-four hours. During the night shift, dust inspections may be made rapidly, using only the beam from an ordinary flash-light to detect dust leaks.

In the case of some gases and vapors, the sense of smell often permits detection of gas concentrations which exceed desirable limits. Such a test is quite unreliable. An individual may become accustomed even to such dangerous or disagreeable odors as hydrogen sulfide in a few moments. It is risky, therefore, to estimate their strength by smell.

Such crude tests do not take the place of regular sampling technique. How often the routine samples should be taken depends entirely upon local conditions. In some places, they are taken daily, while in others, several times a year is enough. It is well to play safe and to take them too often rather than too seldom. The men quickly become used to such sampling and pay no attention to the procedure. Obviously, the sooner the sampler has the man's interest in his results, the better will be the outcome.

Samples should be taken wherever men work. It is a mistake to ignore places where one believes that there is no dust or gas. The samples are about the only proof that the employer can bring forth that he has taken proper precautions to prevent a disease, such as silicosis or a chronic poisoning from benzol. The mere statement that he or anyone else thought the atmosphere sufficiently clean is not enough.

Occasional photographs of various plant and mine operations are often of greater practical usefulness than are records of dust counts or of gas or vapor concentrations. As an exhibit on the company's bulletin boards, photographs are effective warnings to the men to clean up.

INTERNATIONAL CONGRESS ON GLASS POSTPONED UNTIL 1940

On February 28 and March 1, 1939, various technical committees of the Deutsche Glastechnische Gesellschaft met in Berlin to consider suitable subjects for the technical program of the Congress. The results of these considerations, together with reports from committees dealing with matters of general organization, were in turn discussed at two later meetings. The President of the International Commission, W. E. S. Turner, was present at these meetings.

Much work had been accomplished. National Committees had been set up in ten countries. Offers of technical papers had been received, but the delay in receiving notifications of these papers had imposed difficulties on the officers and organizing committee to such an extent that it seemed impossible to get through all the work of preparation satisfactorily by the date originally proposed, namely, July 6, 1939; the arrangements, however, might have been completed if the meeting were postponed until September.

From the industrial side, a Glass Exhibition had been planned to be held simultaneously with the Congress at München. These plans were beginning to assume definite form, but the amount of preliminary work involved in organizing such an Exhibition made it quite evident that much more time was needed for the preparation than was available by September, 1939.

Under these circumstances, a postponement until 1940 has seemed advisable. The President of the International Commission, therefore, desires me to inform you that he has approved of the postponement of the Congress until 1940.

The actual date of the Congress will be announced later after consultation with members of the Commission and of the national committees. It is not proposed to suspend the activities of the various organizing bodies or of the Commission but to proceed systematically with all the details of organizing the Congress so as to insure its success.

—H. MAURACH, *Secretary,*
International Commission on Glass

CERAMIC HISTORY

ELLSWORTH WOODWARD

Ellsworth Woodward died at the Baptist Hospital in New Orleans, February 28, 1939. Tulane University, in 1933, conferred upon him the degree of Doctor of Learned Laws. He held honorary membership in the Providence Art Club, Phi Beta Kappa, and the Round Table Club, and membership in the Louisiana Art Teachers' Association, the National Society of Craftsmen, and the Society of Arts and Crafts, Boston.

Ellsworth Woodward will live in the South as more than a name.

His personal history can be recorded in the simplest terms because there is so little of it apart from Newcomb College. He was born in Bristol County, Massachusetts, on July 14, 1861. As a young man in his early twenties, when he had already studied abroad and during his first teaching experience at the Rhode Island School of Design, he was called to Tulane in the fall of 1885 as assistant to his brother, William Woodward, then professor of art at the University. When Newcomb was founded in 1887, Ellsworth Woodward was made professor of art there. For forty-three years he was "the Newcomb Art School."

We dare say no other individual, over so many years, has been quite so consistently of fine service to New Orleans and the South. Not only did he build up the modest "art class" in a girls' school into a distinguished art department, but, expanding Newcomb's art horizon still further, he gave it a nationwide importance.

This was a tremendous accomplishment, especially in view of the fact that it was, and is, a school exclusively for women and has been obliged therefore to face the competition of the most important co-educational art schools. It would have been easy, under the circumstances, to relax into mere feminine prettinesses and clevernesses and not to have aspired tirelessly toward an ideal worthy of men and women alike. Professor Woodward had to see hundreds, thousands perhaps, of his most talented young women turned aside from promising art careers by the more urgent calls of life. But even then the shoots of esthetic life were not planted in vain; and today there are no states in the South, and few in the Union, in which there are not growing gardens of culture from seed planted by study under Ellsworth Woodward and his staff, either at the beautiful old studio building at Sixth and Camp streets or during the many later years at the efficient art plant on the new Newcomb campus.

That shift of place, though it obviously was onward and upward, struck a severe blow to Professor Woodward, who had built so much of his very heart's blood into the original art structure. The fine artist and fine instructor and fine administrator, however, was fortunately spared to the institution through sufficient years to have the new place mature under his guidance and to be converted from a raw promise on bare grounds to new beauties and new promises for the future.

Had it not been for the inner call to "see it through," it is improbable that Professor Woodward could have resisted so long putting from him the intense duties of his executive position. Behind the love he felt for the pedagogics of art, in which latter field he has won a place none higher, there was the deeper and more personal love of art from the practitioner's viewpoint. His innumerable responsibilities at the school permitted him to give but minutes to his own creative work where otherwise he would have lavished days. Despite these obstacles, Professor Woodward has managed to build up a sum of output that must be reckoned with in considering the art product of the South over the past half century.

Known chiefly for his water colors, after he divested himself of his school duties there remained years of independent time for a full enjoyment of practicing many things that he had been forced to leave in the realm of theory.

More than painting, he loved the graphic arts, claiming Edwin Abbey, Albert Dürer, and Anders Zorn as his masters. When he traveled as lecturer with the Bureau of University Travel, he would not allow himself the use of a camera, but snatched every leisure moment for a sketch with pencil or brush. His older friends will remember the annual December show at old Newcomb, when Mr. Woodward spread on the walls of the art gallery the richness of his summer experiences in foreign lands; and the number and beauty of the etchings produced after his retirement give further evidence of his mastery in the field of graphic art.

Other honors and responsibilities have come to him. He was trustee of the Delgado Museum and its curator; he has held high positions in countless other such organizations; he was president of the Southern States Arts League; and, as one of the lecturers of the Bureau of University Travel, he has interpreted the messages of the galleries of Europe to students from all parts of the United States. Primarily, however, he was the Newcomb School of Art. But for him, Southern women's opportunites for the development in artistic endeavor would not have been established as they have been in the South; nor could their education in northern or eastern centers have given the distinctively Southern arts that have been developed at Newcomb.

Newcomb pottery is justly famous, not merely because it was awarded, among other prizes, a medal at the International Congress in Paris in 1900, and the grand prize over all other school exhibits at the San Francisco World's Fair. It is famous because of Ellsworth Woodward, though the story of its gradual evolution from a school product to a ware which is equal to that made by the best ceramic specialists will never be completely told. There is, for example, the long search Professor Woodward conducted with his potter, Joseph Meyer, for the clay that was to be the basis of a new departure in ceramics; the patient testing of various soils in combination; the final decision for river loam filtered out of the Mississippi's water at the New Orleans purification plant. There is the laborious research that gave Newcomb, and through Newcomb, the ceramic world, a new glaze and new pottery tints.

For almost any other man this alone would have constituted a monumental life work, but for Ellsworth Wood-

ward this was merely one detail. There were the classes in drawing and painting and in formal design, the distinctive textile work, and fine craftsmanship in bookbinding and metal work, and the development, at his distinct insistence, of a series of typically Southern designs. When other art schools were adapting designs from museum collections, his students were seeking original design sources through careful plant study.

Newcomb's school of art, however, practical as its conduct was, was not merely a workshop for apprentices and journeymen in the finer handicrafts. Under Ellsworth Woodward it could not be that, for he was primarily an artist and a teacher of artists. Before "regional art" became an accepted phrase, his composition students knew that only pictures based on personal experience and knowledge of their own environment were acceptable. His gift of word and phrase and his vivid use of apt expression brought dry treatises and discussions into pulsing life. He made his art history classes so interesting that visitors and students from other departments frequently asked the privilege of attending. How many have heard his graphic phrases, and, hearing, have remembered more clearly the point he was striving to drive home.

To have stood with him in the austere Cathedral of Florence, in the peaceful corridors of San Marco, or before Rembrandt's "Night Watch" was a spiritual experience never to be forgotten. He always said that he was a teacher, not a lecturer, but in the presence of the work of a master his graphic expressions and his genuine emotions moved his hearers like the words of a great orator. Like the disciples at Emmaus, "their eyes were opened and they said one to another, did not our heart burn within us when he talked with us by the way?"

In a recent *Atlantic Monthly*, Alexander Woollcott says of Annie Sullivan, "For the book" (by Helen Keller) "there can be, I think, but one title. That title would consist of one word. The word is 'teacher.'" Ellsworth Woodward will always be "teacher" to the hundreds of his Newcomb daughters and to other hundreds who have followed him through the galleries of Europe.

In the years to come we shall miss—and miss keenly—the spare, active figure surmounted by the alert features which for half a century has been here, there, and everywhere about the school of art. We shall miss the pithy comments, and, with it all, the rather shy self-consciousness of a man in whom we revered knowledge, power, genius, and an almost limitless endurance. But we shall never miss the spirit which he and he alone brought to Newcomb and instilled in the school that he built from the very foundation stones. For that spirit, which is Ellsworth Woodward himself, will be a vital presence as long as there is a Newcomb School of Art.

HISTORICAL DATA ON THE AMERICAN CERAMIC SOCIETY

Year	Meeting Place	President Elect	Vice-President Elect
1899	Columbus, Ohio	H. A. Wheeler (general)	Ernest Mayer
1900	Detroit, Mich.	Karl Langenbeck (general)	C. F. Binns
1901	Old Point Comfort, Va.	C. F. Binns (art)	Ernest Mayer
1902	Cleveland, Ohio	Ernest Mayer (whiteware)	F. W. Walker, Sr.
1903	Boston, Mass.	E. C. Stover (whiteware)	Heinrich Ries
1904	Cincinnati, Ohio	F. W. Walker, Sr. (whiteware)	A. V. Bleininger
1905	Birmingham, Ala.	W. D. Gates (terra cotta)	Ellis Lovejoy
1906	Philadelphia, Pa.	W. D. Richardson (structural clay)	Samuel Geijsbeek
1907	St. Louis, Mo.	S. G. Burt (art)	R. C. Purdy
1908	Columbus, Ohio	A. V. Bleininger (whiteware)	Charles Weelans
1909	Rochester, N. Y.	R. C. Purdy (general)	A. S. Watts
1910	Pittsburgh, Pa.	Heinrich Ries (general)	R. R. Hice
1911	Trenton, N. J.	Charles Weelans (whiteware)	L. E. Barringer
1912	Chicago, Ill.	A. S. Watts (general)	C. W. Parmelee
1913	Washington, D. C.	Ellis Lovejoy (structural clay)	A. F. Hottinger
1914	Wheeling, W. Va.	C. W. Parmelee (general)	D. T. Farnham
1915	Detroit, Mich.	R. R. Hice (structural clay)	R. T. Stull
1916	Cleveland, Ohio	L. E. Barringer (whiteware)	F. K. Pence
1917	New York, N. Y.	G. H. Brown (general)	C. E. Jackson
1918	Indianapolis, Ind.	H. F. Staley (enamel)	A. F. Greaves-Walker
1919	Pittsburgh, Pa.	R. T. Stull (structural clay)	R. H. Minton
1920	Philadelphia, Pa.	R. H. Minton (whiteware)	E. T. Montgomery
1921	Columbus, Ohio	F. K. Pence (whiteware)	F. B. Ortman
1922	St. Louis, Mo.	F. H. Riddle (whiteware)	E. Ward Tillotson
1923	Pittsburgh, Pa.	A. F. Greaves-Walker (refractories)	R. D. Landrum
1924	Atlantic City, N. J.	R. D. Landrum (enamel)	R. M. Howe and August Staudt
1925	Columbus, Ohio	E. Ward Tillotson (glass)	F. H. Rhead
1926	Atlanta, Ga.	R. L. Clare (terra cotta)	B. Mifflin Hood
1927	Detroit, Mich.	B. Mifflin Hood (structural clay)	M. C. Booze
1928	Atlantic City, N. J.	M. C. Booze (refractories)	R. R. Danielson
1929	Chicago, Ill.	G. A. Bole (general)	F. A. Harvey
1930	Toronto, Canada	Edward Orton, Jr. (general)	P. E. Cox
1931	Cleveland, Ohio	E. V. Eskesen (terra cotta)	Alexander Silverman
1932	Washington, D. C.	E. P. Poste (enamel)	W. Keith McAfee
1933	Pittsburgh, Pa.	J. C. Hostetter (glass)	L. J. Trostel
1934	Cincinnati, Ohio	W. Keith McAfee (whiteware)	J. M. McKinley
1935	Buffalo, N. Y.	J. M. McKinley (refractories)	F. C. Flint
1936	Columbus, Ohio	F. C. Flint (glass)	R. B. Sosman
1937	New York, N. Y.	R. B. Sosman (refractories)	V. V. Kelsey
1938	New Orleans, La.	V. V. Kelsey (materials)	A. I. Andrews
1939	Chicago, Ill.	A. I. Andrews (enamels)	J. L. Carruthers

A CHECK LIST OF EARLY NEW ENGLAND POTTERIES*

COMPILED BY F. H. NORTON

Knowing the interest of The Society in historic material in the field of ceramics, I am sending a check list of early New England potteries, a list much more extensive than most of us would have believed possible. I think that this list will bring out clearly the important position that New England held in the ceramic industry in Colonial times and up to the early part of the Nineteenth Century. This should also be of importance to collectors of this early ware, which represents our best folk pottery.

Two photographs are also inclosed which are rather unique. One of them is a photograph in the yard of the Exeter Pottery taken about 1880 showing the old clay mixer which was commonly attached to all the potteries of that time, and of the workman. The other photograph is one that I took about ten years ago of John Donovan throwing redware flowerpots in the Paige Pottery of Peabody, the last of the old-time potteries. Mr. Donovan is considered to be the last of the old New England potters. He did some throwing for Arthur Baggs at one time, and without exception was one of the most skillful throwers I have ever seen.

The following check list of early New England potteries comprises those potteries which started before 1900 in the New England states. Some of these potteries are well known, but the majority of them are so obscured by their location in small towns, where no careful history is available, that little more than their existence is known at present. Wherever possible, references have been given to the source of the material, but a great many of the names have been obtained from private communications and excavations at the old site. The pottery industry was a very flourishing one in the early part of the 19th Century in the New England district, as nearly every town and city had a local pottery; a town, such as Peabody, had as many as thirty potteries operating at one time during the War of 1812.

Some of these potteries were rather large establishments, such as that of the Bennington Pottery or the Gruby Tile Company in Boston, but the majority of them were small family affairs with only two or three workmen.

The list of potteries is certainly by no means complete, and I would be only too glad to receive any information which members of The Society may have to add to this check list.

In preparing this list, much assistance was received from Lura Watkins, who has done a great deal of research on this subject. The late John Donovan also provided many facts from his long experience in many New England potteries.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASS.

* Received November, 1938.

References*

(1) J. Spargo, Potters and Potteries of Bennington.
(2) J. Spargo, Early American Pottery and China.
(3) A. H. Pitkin, Early American Folk Pottery.
(4) *Antiques*.
(5) New England business directories.
(6) H. Ries and H. Leighton, "History of the Clay-Working Industry in the United States."
(7) Old-time New England magazine.
(8) E. A. Barber, Pottery and Porcelain of the United States.
(9) *Boston Gazette*.
(10) *Boston News Letter*.
(11) Proceedings of Society of Arts.
(12) Local city directories.
(13) Massachusetts state directories.
(14) *Hobbies*.
(15) N. E. Mercantile Union Directory
(16) *American Collector*.

* The footnote reference numbers in the tabular data (column headed "Firm name") refer to this reference list; the particular page or year of the reference follows the footnote number in the table.

John Donovan making flowerpots in Paige Pottery, Peabody, Mass. (time per pot, 2 to 3 minutes). Photo, March 24, 1931.

CONNECTICUT POTTERIES

NOTE: For footnote references see Reference List in the introduction

Location	Date of operation	Type of ware	Firm name	Owners or potters and remarks
Bridgeport	1814	Stoneware	Bridgeport Potteries†	
East Haven	1865	"	John McPherson	
Elmwood	*ca.* 1790	"	Goodwin[3]	
Fairfield		"	Dyer	
Goshen	*ca.* 1804–1870	Redware	Hervey Brooks	Jesse Wadhams
Hartford	*ca.* 1790	"	John Souter	
	1790	"	Nathaniel Seymour[3]	Used local clay; 4 throwers
	1856	Stoneware	M. C. Webster & Sons[5] (1856)	
	1860	"	Webster & Seymour	
	1865	"	H. B. Russell[5] (1865)	
	1820–1870	"	Goodwin Pottery[5] (1856)	
	1894–	Stoneware and faience	Hartford Faience Co.	
			Seymour & Bosworth	

† *Antiquarian*, April, 1928.

CONNECTICUT POTTERIES (*continued*)

Location	Date of operation	Type of ware	Firm name	Owners or potters and remarks
Hartford (West)	1856	Stoneware	O. S. Cadwell[5] (1856)	
	1856	"	Harvey Goodwin[5] (1856)	Thomas Goodwin
Litchfield	1753	Redware	John Pierce[2]	
Manchester Green		Stoneware and earthenware		
Naugatuck	1856	Stoneware	Edwin Benham[5] (1856)	
New Haven	1856	"	Stedman & Seymour	
New London		Probably stoneware		
Norwalk	1825	Redware	Quintard Pottery	James Quintard
		Redware and stoneware	Norwalk Pottery Co.[7] (April, 1934)	Asa A. Smith
		Stoneware	A. E. Smith & Sons	
	1825	"	Smith and Day	Several more firms in this town
Norwich	1840–1895	"	Norwich Pottery Works[4] (Oct., 1923)	Sidney Risley
	1796	Redware	C. Potts & Son	
Stamford	1860		Wardell & Gibson	
Stonington	1798	Probably redware	Stonington Pottery[8] (p. 435)	Jos. and Adam States
Waterbury	1856	Porcelain teeth	Porcelain Mfg. Co.[5] (1856)	Green Kendrick
Woodstock	1793	Redware	Thomas Bugbie*	

* Earle, China collecting in America.

MAINE POTTERIES

Location	Date of operation	Type of ware	Firm name	Owners or potters and remarks
Alfred	1791	Redware	Joshua Emery[7] (April, 1932)	
	1805	"	Daniel Holmes[7] (April, 1932)	
	ca. 1815	Stoneware	Lambert & Webber[7] (April, 1932)	
Bangor			Bangor Stoneware Co.	
Bloomfield	1856		Jos. Philbrick[5] (1856)	
Bridgton (North)	1849–	Redware	Richard T. Gibson[5] (1860)	Richard Kitson
Brooksville		"	See Reference 14 (Sept., 1934)	
Brunswick	1823–		J. Barker, 2nd (History of Brunswick)	
Buxton		"	Bickford[7] (April, 1932)	
Ellsworth	1856		Elisha Jones[5] (1856)	
Farmingdale	1868		F. A. Plarsted	
Farmington	*ca.* 1820		Josiah Norcross	
Fayette		"	John Bodge[5] (1856)	
Gardiner	1860	Stoneware	Gilman & Clark[5] (1860)	
Gorham			Smith & Prentiss (History of Gorham)	
Hallowell	?–1800	Redware	Samuel Norcross	
Hollis Center	1860		J. Auld	Kendrick Truxton
Lisbon	1860		John Barker[5] (1860)	
Livingston	?–1880	"	Davis[14] (Sept., 1934)	
Limington	?–1880	"	Davis Pottery[7] (April, 1932)	
Monmouth	1865	"	Silas Coburn	J. M. Safford
Orrington	1856	"	George Brooks[5] (1856)	
Oxford	1860		Moses G. Webber[5] (1860)	
Portland	1801	"	Benj. Dodge (on Green St.)[7] (April, 1932)	
		Stoneware and Rockingham	Portland Stoneware Co.	
	1840–1885	Stoneware	Lampson & Swasey	
		"	M. Crafts & Co.	
Skowhegan				
Topsham	1796	Redware	Eli Cox	David Flagg (Barker also had Pottery in 1835)
Waldboro	1860		Stanwood & Mayhew[5] (1860)	J. H. Stanwood
Wayne	?–1830	"	John Bodge[5] (1860)	
Westbrook	1856		J. T. Winslow[5] (1856)	
Windham	1825–1850	"	John Goodell[7] (April, 1932)	
Wiscasset				
Woolwich	1820–1885	"	John Corless[7] (April, 1932)	Howard Corless (some pieces of this ware in H. G. Otis house)
Yarmouth	1791–1880	"	John Thomas[7] (April, 1932)	Later, Joel Brooks
	1806–1850	"	Cleaves Pottery[5] (1860)	Ebenezer Corless (also Geo. Bruce, D. Cleaves, & R. Cleaves)
	?–1890	"	Foster's Pottery	Benj. & W. H. Foster

Massachusetts Potteries

Location	Date of operation	Type of ware	Firm name	Owners or potters and remarks
Ashfield	1843–1850	Stoneware	W. & E. Orcutt & Co.	
	1850–1856	"	Hasting & Belding	Clay from Perth Amboy, N. J.
Ballardvale	?–1890	"	Willard & Sullivan	
Barnstable	1849	Redware	Benj. Parker[15] (1849)	Noted for green glaze
Beverly	1865–1905	"		Main output flowerpots
Boston	1751	"	David Simons[9]	Near Dr. Mayhew's Meeting House
	ca. 1804	Stoneware		
	1853	Yellow and Rockingham	Boston Earthenware Mfg. Co.[4] (June, 1924)	
	1854	" "	N. E. Pottery	F. Meagher
Boston (East)	1865	Whiteware	East Boston Pottery Co.[5] (1865)	
	ca. 1880	Yellow and Rockingham	Totty Yelland	
Boston	1897–1907	Faience and tile	Grueby Faience & Tile Co.	Ware of great artistic merit (100 employees)
Brookfield (East)	1878–1888	Redware	Lynby & White	Watson & Howland (6 to 8 men; many flowerpots)
Cambridge	1888–1938	"	A. H. Hews & Co., Inc.[6]	Started in Weston
Cambridge (East)	1856	"	James S. Runey[5] (1856)	
Cambridgeport	1870	Stoneware	Bullard & Scott	
Charlestown	1734	Redware	John Webber[10]	
	1744	Redware and yellow	Thomas Symmes[10]	Near swing bridge (perhaps stoneware)
	1845–1868	Stoneware	Richard Osborn	
	1856–1905	"	Edmonds & Co.	Clay from N. J.; large production
	?–1850	"	Barnabas Edmonds	
	18 ?			
		"	Powers & Edmonds	
Chelsea	*ca.* 1800		Amos Seavey	
	ca. 1840	"	Loammi Kendle	
	1866–1888		Chelsea Keramic Art Works	Robertson (now in Dedham)
	1879–1900	Art tile	J. and J. G. Low	Clay from Martha's Vineyard
Concord	1765	Redware	Seth Rose[9] (1765)	Near Concord Meeting House
Danvers	1750–1860	"	Jos. Reed	
	1860	"	Richard Osborn	Many other redware potteries here
Dedham	1888–1938	Artware	Dedham Pottery	Robertson (crackle porcelain)
Dorchester	1890–1938	Stoneware	Dorchester Pottery Works	C. W. Henderson (clay from N. J.)
Germantown	1760–			(Now South Braintree)
Gloucester	*ca.* 1650	Redware	William Vincent	
	1694–1749	"	Jos. Gardener	
	ca. 1750	"	Daniel Bailey	
Kingston	1851	"	Stephen Bradford[13] (1851)	
Lee			See Reference 8	
Lynn (Saugus)	1808	"	William Jackson	Local clay used; black glazed ware
Medford	1754	"	Jonathan Hale, Jr.[9] (1754)	
Merrimack	1790	"	James Chase	
	1825	"	Smith Sargent	
	ca. 1850	"	Peaker Pottery	
Merrimackport	1816–1856	"	Chase & Kenrick[5] (1856)	James & Phineas Chase (clay from Plaistow, N. H.)
Newburyport	1775	"	Ebenezer Morrison	Local clay
	1764–1799	"	Daniel Bailey & Sons[4] (Nov., 1938)	Jos. Bailey (made slip decorated ware)
	1890	Artware	Merrimack Pottery	Also known as Nickerson Pottery
Orange (North)		Redware	Charles Goddard*	Obadiah Marble
Peabody	1736	"	Osborne Pottery	Joseph Osborne (18 separate Osborne potteries)
	1753	"	Southwick Pottery	161 Lowell St. (black glazed ware)
	ca. 1800	"	Wilson, etc.	59 redware potteries known in Peabody
Princeton	*ca.* 1850	"		At Wachusett Mt.
Quincy	1760	"	J. C. Palmer	
Rowley	1720–1735	"	Jos. Bailey[4] (Nov., 1938)	
Roxbury	1763	"	Jonathan Hall	
Salem	1641	"	John Pride	
	ca. 1880	"		
Somerset		Redware and stoneware	Thomas Kenney	3 or 4 potteries at lower end of town
	1868	Stoneware	Somerset Potters Works	

* *The Chronicle*, Nov., 1936.

MASSACHUSETTS POTTERIES (*continued*)

Location	Date of operation	Type of ware	Firm name	Owners or potters and remarks
Somerville	1865	Redware	John Runey[5] (1865)	James Runey (off Cross St.; mostly flowerpots)
		"		
Stirling (West)	1853	"	Wachusett Pottery	W. D. Sime & Co. (first steam-driven throwing wheels in N. E.; Rockingham glaze; some production until 1925)
	1866–1895	"	"	Snow Smith & Co.
	ca. 1860	"	"	A. S. Wight & Co.
Taunton	1860	Stoneware	F. T. Wright[5] (1860)	
	1868	"	F. S. Wright & Sons	
Weston	1765–1888	Redware	A. H. Hews & Co.	
Whately	1777	Redware and stoneware	Jonathan Pierce	
	1797		Stephen Orcutt	Eleazer & Walter Orcutt (many other firm names)
	1802	Redware and stoneware	Thomas Crafts	James L. Crafts (also made black glazed teapots)
	1820	Redware	Perry and Co.	Sanfred S. Perry (black glazed teapots)
	1830	"	Rufus Crafts	Red lead came from Salem
Williamson			See Reference 8	
Worcester	1850–1889	Stoneware	F. B. Norton	On Water St.
	1858	"	Frederick Hancock	Eastern Pt.

NEW HAMPSHIRE POTTERIES

Boscowen	1804–1856	Redware	Jeremiah Burpee[5] (1856)	
Chesham		"		
Concord	1800–1876	"	Milville Pottery[4] (1856)	Jos. Hazeton, D. Clark
Dover	1856	"	Jacob Osborn	
Dublin	1850		Hart & Clark	
	1861		Dublin Earthenware Mfg. Co.	Eben Russell & Son
Exeter	1872	"	Samuel Leavett	
	1780–1895	"	Lampson & Dodge	Machines in Ford Museum
Gonic	1839–1885	"	Osborne Pottery[4] (Feb., 1931)	Elizah & James Osborne (some ware in Mass. Inst. of Tech. Museum)
Jaffrey	1817–	Yellow ware	Started by Wight[8]	Clay from Moncton, Vt.

Exeter Pottery Works, Exeter, N. H.

NEW HAMPSHIRE POTTERIES (*continued*)

Location	Date of operation	Type of ware	Firm name	Owners or potters and remarks
Keene	1871–1905	Red, white, and yellow	Taft & Co.[8]	
London	1820–1840	Redware	Green Osborne	
Marlboro	1853	"	Sargeant & Greenwood	
Milville	1798	Daniel Clark	See Reference 7, April, 1932	
Nashua	1838–1850	Stoneware	Martin Crafts[4]	James & Caleb Crafts (on South Main St., clay from N. J.)
North Conway	1856	Redware	Jethro Furber[5] (1856)	
Orange	1818–1887	"	Lowell Pottery[5] (1856)	Elijah C. & Isaac Lowell
Plymouth	*ca.* 1850	"	John H. Gill[8]	William Webster
Pottersville	1850	"	Dublin Earthenware Manufactory	Eben Russell & Sons
	1855	"	Russel N. Osgood	2 potteries in this town
	1861	"	Hart & Clark	
Portsmouth	1839–1851	"	Joseph Dodge	13 North St.
Troy	1875–1881	"		

RHODE ISLAND POTTERIES

Greenwich	1775	Redware	Isaac & Samuel Upton[7] (Jan., 1931)	
Providence (North)	1767	"	Jos. Wilson[7] (Jan., 1931)	

VERMONT POTTERIES

Bennington	1793–1894	Redware and stoneware	Norton Potteries[1]	John Norton, etc. (many marked pieces of stoneware extant
	1850–1859	Rockingham and Parian	United States Pottery[1]	C. W. Fenton, etc. (employed a number of skilled English potters)
Berlin	1823–1834	Redware	Justus & Justin Crafts	
Burlington	1806		Burlington Pottery Works[4] (Nov., 1924)	N. L. Judd
	1854	Stoneware	Nichols & Alfred	
		Stoneware and Rockingham	Ballard & Bros.	A. K. Ballard
Cavendish		Redware		
Dorset Hollow		Stoneware	Jonathan Fenton	
East Dorset		"	Jonathan & R. & C. Fenton	
East Middlebury	*ca.* 1860	Redware	Carpenter	
Fairfax	1856		Lewis & Cody[5] (1856)	S. H. Farrar
Middlebury	1812	Redware and white earthenware	Caleb Farrar[6]	Carpenter
Moncton	1810	Whiteware	See Reference (6)	Local kaolin used
Poultney	1814	Redware	Samuel Woodman	
St. Albans	1860	Stoneware and Rockingham	Boynton & Carrer[5]	
St. Johnsbury	1808–1859	Redware and stoneware	Fenton & Hancock[4] (Oct., 1923)	R. W. Fenton

COMMUNICATIONS

A POTTER LOOKS AT CHINESE ANTIQUES

BY WALTER A. WELDON

It has been my experience, working through the years with many fine craftsmen in many fields, that although the appreciation for antiques is great, the desire to own them seems to be out of the question because most people labor under the impression that in order to own them one must have money or be in the well-to-do class or be experienced through years of study. Thinking and wishing is well, yet fifty per cent of the road to successful "collecting" is in deciding *what* to collect. A vast field awaits survey.

To tell my story, I must become personal. Some years ago, after a visit to the Metropolitan Museum in New York City where I viewed a collection of Chinese ceramics, I told a friend that some day I hoped to own some of the better examples of the art. He said that in the field of collecting Chinese ceramics was just about the top of the ladder and that a poor man had better not aspire so high. He suggested that I start with gems or gold coins and work up.

My first visit to a Fifth Avenue dealer in fine ceramics almost "floored" me—Persian pieces at $3000; peach blooms at $1500! I apologized and backed out, feeling very much out of my environment, but the dea continued to stick, and I found myself in shops that just handled "junk." I landed in city dumps, where I found that people sometimes throw out the very thing that I wanted. I found that men are employed to pick over the "trash" for old bottles and odds and ends; they deliver these "finds" to shops that deal in everything from old iron to clothing. It is surprising how many people eke out a living in this way, but I have found many choice pieces in just such "junk" shops in sections that most people avoid.

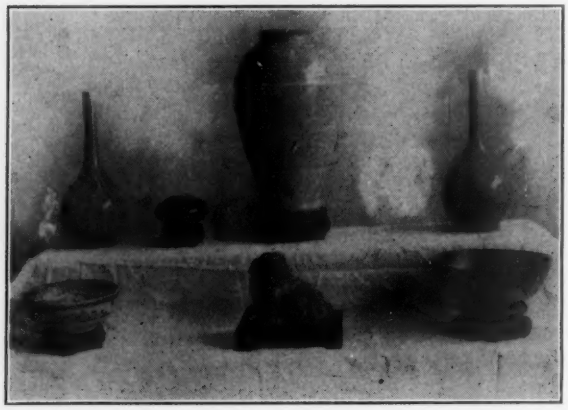
The average small antique shops in the better sections are generally run by small staffs—sometimes only one person. Where does this dealer get his material? Auction rooms supply much of it, but some of the goods must come to him from people in need of money who sell it to him or by consignment from one shop to another. Wholesalers in antiques have large stocks in most cities.

The "unknown men" in the picture are the "runners," that is, men or women who make a living with little or no capital by buying, in most cases at a very low price, and by reselling to the antique dealer old glass, porcelain, etc., that the trade can use. Some of these "runners" are experts in their line. Their association with the better class of people as well as with the art goods improves their taste, and they naturally and unconsciously "drink" it in. They are hard men to meet in the market place; if you make frequent calls in the sections where antiques are sold, you may get to know them. They have regular customers and do not bother with stray "collectors"; they would lose their big market if they did for they must turn over their goods fast.

You must not believe all that you are told when you visit an antique shop—no one can be expert on a thousand different items. The handbooks are not always correct and must be checked.

Choose one special line, and if you are willing to spend the time with literature, museums, and private collections, your knowledge will often surpass that of the dealer.

I called at one shop along the Hudson River in 1938, and upon telling the very stately lady in charge that I was interested in Chinese porcelain, she informed me that her shop was a first-class place and that she made it a practice to keep away from "cheap" goods. This was not the first time I have been insulted in my rounds of collecting. Some dealers, however, make a practice of specializing on one or more items, and you will do well to seek them out. Their prices may be a little higher than the average, but their collection is generally much nearer the top; remember, they too love these pieces. These dealers will be helpful; they want you for a customer.



Top row, left to right: blue bottle vase, Wan Li period; small ox-blood piece, Ch'ien Lung period; large stoneware piece, Sung Dynasty; blue bottle vase (companion piece to extreme left).

Bottom row, left to right: Japanese "Banko" bowl; ox-blood Fu Dog, K'ang Hsi period; Japanese "Satsuma" bowl.

If your income is small, do not let that stop you from being a collector. Antiques are not always high; they are often lower than new goods. It is a great hobby, and people with a hobby are never patients in the "psychiatric" wards.

The illustration shows six pieces that grace my dining room and are "tops" in Chinese and Japanese porcelain. The cost for the lot was $14.00, but it took time to find them. Do not, after reading this article, take $14.00 and rush to the antique dealer expecting to come home loaded down. I covered four large cities in 1938 without seeing a piece of Chinese ox-blood red glaze and I was told that I was wasting my time to look. One dealer took pity on me and gave me his card that would admit me to a shop of a Chinese antique dealer, who sells to the museums and large collectors. The piece there that appealed to me cost $12,000; this no longer shocked me because I now understand the real value—twenty years have taught me to respect the great art of the Chinese potter.

I have been asked repeatedly to explain the high prices of rare Chinese porcelains.

China stopped making these goods years ago. In the first place, they were never made for commercial market. PWA projects are not new in China. Years ago small groups of potters were assigned by the royal houses to devote their lives to perfecting the art. Small quantities were made, and apparently much of this has remained in the hands of collectors.

It takes time and money to go to China to collect these things, and they can not be ordered from a catalogue or by number—they must be ferreted out of hiding. The turnover is slow, the overhead is high, and exclusive shops which handle many of them account for the high price.

European potters have made some progress in reproducing this ware. You can count on your fingers the number of potters in the United States who can even talk about them, let alone make them.

621 Edgewood Street
Baltimore, Maryland

LITHIUM COMPOUNDS IN 1938

The mine production of lithium minerals in the United States dropped off sharply in 1938, but this was more than offset by the recovery of lithium from a new source, *viz.*, as a by-product of the complex brine-refining operations at Searles Lake in California. Potash, sodium sulfate, soda ash, and borax are co-products. The total production of lithium compounds, as given by producers to the Bureau of Mines, aggregated 892 short tons valued at $329,088, compared with 1357 tons with a value of $36,206 in 1937 and 1241 tons worth $34,273 in 1936. Although the tonnage was much less in 1938 than in earlier years, the value was almost ten times as great because the average lithium content was greatly increased as a result of the inclusion of the sodium-lithium phosphate recovered at Trona, Calif., by the American Potash and Chemical Corp.

Three producers reported shipments of lithium ores from South Dakota in 1938. Amblygonite, lepidolite, and spodumene were shipped from Keystone, Pennington County, where the Etta mine was operated by the Maywood Chemical Works and the Ingersol mine by the Black Hills Keystone Corp. Amblygonite was also shipped from the Tinton mine of the Black Hills Tin Co., at Tinton. Small quantities of lithium ores were produced but not shipped from other properties in South Dakota and in North Carolina.

IDENTIFICATION OF INCLUSIONS IN STEEL

April 4, 1939

The Editor,
Bulletin of the American Ceramic Society

Dear Sir:

In the "Symposium on Steel Mill Pouring Pit Refractories"† presented at the meeting of the Refractories Division at Bedford Springs, Pa., a good deal was said about the difficulties caused by the inclusion in the steel of particles from the refractories.

Probably most of the inclusions seen in a polished or etched surface of steel are oxides formed by deoxidation of the metal with manganese, silicon, or other additions, but some of them have characteristics that lead the petrologist to believe that they were originally particles of clay. Such particles must have come either from the runner which conducts the steel from the open-hearth furnace into the ladle or from the ladle lining, the sleeve brick, the stopper, or the nozzle. The last is naturally most open to suspicion because particles torn from the nozzle by the outgoing stream of steel are sure to enter the ingot mold, but there is no positive proof that any group of inclusions discovered in a particular specimen have come from the nozzle rather than from other clay refractories with which the metal has been in contact.

It occurs to me that it may be possible to identify the source positively by mixing with the clay batch of experimental nozzles, runners, or the like, a radioactive material, such as a thorium or uranium mineral or salt. Radioactivity is uninfluenced by temperature and chemical combination; hence, if most of the uranium or thorium oxide stayed with the clay with which it was originally mixed, as there is every reason to believe it would, an inclusion could be tested by laying the polished steel specimen on a piece of photographic paper or film. The inclusion would then identify itself by its photographic action; other inclusions which had come from other sources would produce no impression.

The amount of radioactive material to be added in order to obtain a recognizable effect would have to be found by experiment. This method of tracing the origin of a material by the radioactivity associated with it has been used in chemical and biological problems, but as far as I know it has not been applied to this problem of inclusions of refractory material in steel.

—ROBERT B. SOSMAN, *Research Laboratory, United States Steel Corporation, Kearny, N. J.*

† *Bull. Amer. Ceram. Soc.*, **18** [3] 79–92 (1939).

HOW TO FIRE FRESH GROG

February 20, 1939

Question from English Manufacturer

I am wondering whether you or any of your members can help me with a problem connected with the production of refractories.

The same problem quite likely affects a large number of the English manufacturers.

It is regarding the question of preparing grog. With the increased use of this material, the old method of using up "wasters" is inadequate, and today clay has to be ground, pugged, and extruded into rough shapes, generally measuring 12 by 9 by 3 in. or 12 by 9 by 4½ in., dried, and fired with ordinary refractories. Those manufacturers who use rectangular or round intermittent kilns use grog lumps for the bottom course; others firing continuous kilns generally use the bottom deep on the tunnel car.

Firing must be done, but it does seem to be a rather expensive way to produce grog. Is there any firm making or using a rotary kiln, rather like a cement kiln, where the clay is fed into one end in its raw state, is fired during its passage through the rotary kiln, and comes out ready to be ground for grog? Theoretically this seems to be about the cheapest method one could adopt, but I can not find any English firm using this method or any manufacturer who is interested in making such a kiln.

Any information your members may pass on to me will be very much appreciated. I hope I am not troubling you unduly on this question, but it is one that is quite serious today.

—JOHN F. TREVOR, *Moira Road, Woodville, near Burton-on-Trent, England*

SUGGESTIONS FOR WRITING BATCH SPECIFICATIONS*

BY JOHN E. BOYD

Great improvements have been made in ceramic raw materials in recent years. New materials have been developed, and improvements in refining and beneficiation of materials long in use have been made.[1]

Raw material producers are usually equipped to furnish chemical and physical data on nearly all ingredients used by ceramists. Standard classification of some of the materials have been established.[2] Others are produced under regular brand names representing products of standardized physical and chemical properties.

A review of recent ceramic literature indicates that authors and users are inconsistent in writing batch formulas, in that definite percentages of ingredients are given without limiting their composition with brand names or standard classifications.

Commercial grades of feldspar have been developed for the glass, enamel, and whiteware industries, covering a wide range of chemical analyses, screen analyses, and physical properties. Feldspar is now available, varying in fineness from 325-mesh to granular 20-mesh; chemically, the variations are almost as wide.

There are numerous examples of formulas in the literature which specify to within a fraction of 1% simply "feldspar," "spar," "body feldspar," or just the name of the State of their origin. With such wide variations between different grades of feldspar now available, it is apparent that chemical and screen analyses or the grade number and mesh of commercial standards should be specified in batch formulas.

In Maine, commercial grades of feldspar have widely different analyses as illustrated below:[3]

	(%)	(%)
SiO_2	74.0	65.4
Al_2O_3	14.8	19.6
Fe_2O_3	0.1	0.1
CaO	0.3	0.2
MgO	Tr	Tr
K_2O	8.1	11.3
Na_2O	2.6	3.4
Ignition loss	0.2	0.2
Free quartz	25.8	0.4

* Received March 24, 1939.

[1] Editorial, "New Raw Materials," *Ceram. Ind.*, **32** [2] 76 (1939).

[2] Commercial Standards Classification, 23–30 Feldspar.

[3] B. C. Burgess, Feldspar Chapter XIV, Industrial Minerals and Rocks, p. 261. A.I.M.M.E., 1937.

From North Carolina the range is even wider as shown by the following analyses:[3]

	(%)	(%)	(%)
SiO_2	73.5	67.0	70.0
Al_2O_3	15.3	18.5	18.1
Fe_2O_3	0.1	0.07	0.1
CaO	0.5	0.3	1.5
MgO	Tr	Tr	Tr
K_2O	7.3	11.8	3.5
Na_2O	3.0	2.0	6.5
Ignition loss	0.3	0.3	0.3
Free quartz	25.2	5.9	15.7

An example of differences in body compositions that may be caused by using different grades of feldspar is illustrated by the following batch formulas.[4] Assuming an average grade of body feldspar to be used in the original, formulas illustrating the differences in compositions have been calculated on the basis of using two grades of feldspar produced in Maine with the analyses previously given.

	Original formula with av. 69 grade feldspar	65 grade Maine feldspar	73 grade Maine feldspar
Body feldspar	19.3	21.5	15.9
Flint	40.5	38.3	43.9
American ball clay	15.0	15.0	15.0
American china clay	25.2	25.2	25.2

These formulas illustrate only the differences caused by variations in the silica in different grades. The alkalis also vary considerably in some grades as shown especially in the analyses of commercial grades produced in North Carolina.

Pyrophyllite and talc, though in use only a few years in ceramic products, are now available in several grades. Analyses of commercial grades of pyrophyllite made in the laboratory of the Tennessee Mineral Products Corporation show a range as follows:

	Maximum (%)	Minimum (%)
SiO_2	80.7	68.0
Al_2O_3	24.5	15.1
Fe_2O_3	0.6	0.1
CaO	0.3	0.1
Alkalis	4.0	0.0
Loss on ignition	4.2	2.5
Grinding	325-mesh to 80-mesh	

Some grades of talc, entirely unsuitable for certain ceramic products, may be satisfactory for others. With such wide differences in commercial grades of ceramic raw materials, it is apparent that definite grade specifications as well as proportional amounts should be given in batch formulas. This is consistent with the technical development of raw material production and the engineering skill directing ceramic manufacturing to use the more definite product compositions now available in writing batch specifications.

TENNESSEE MINERAL PRODUCTS CORPORATION
SPRUCE PINE, NORTH CAROLINA

[4] A. S. Watts, "Data on Influence of Firing Time on Properties of Some Whiteware Bodies," *Jour. Amer. Ceram. Soc.*, **19** [6] 175–76 (1936).

GAS CLOUDING OF ENAMEL: I

BY ALFRED HORN

The gas clouding of enamel in recent years has increased in importance chiefly for two reasons.

(1) Gas clouding has been developed and perfected so that it now may successfully compete with the solid clouding of enamel by means of stannic oxide, antimony oxide (leuconin), cerous oxide, etc. Indeed, in many respects, gas clouding of enamels is superior to solid clouding.

(2) Gas clouding is not only appreciably cheaper than solid clouding, but, of much greater importance, the necessary raw materials are available in all countries. The raw materials necessary for the production of solid clouding agents must be imported into most countries, including Germany, and are therefore burdened with import duties. This is of great significance for countries which are striving for self-sufficiency.

The most important difference between gas clouding and solid clouding will be briefly discussed.

The clouding effect of solid clouding agents, including primarily the oxides of the metals, tin, antimony, cerium, zircon, etc., is effected by microscopically small particles of these metallic oxides, which are usually ground wet in the mill with the previously clouded white enamel frits. They are incorporated in the enamel liquid without decomposition when the enamel layer is fired on in the muffle furnace. This may be easily verified with the aid of a microscope. Because the refractive index of the metal-oxide particles incorporated in the enamel liquid is greater than that of the enamel liquid itself, refraction and diffusion phenomena are produced by the incident light, and the final result is the production of a clouding effect.

According to these premises, this effect will increase in direct proportion to the magnitude of the difference between the refractive indices of the metal-oxide particles incorporated in the enamel liquid, which are designated in brief as "clouding agents," and the refractive index of the enamel liquid itself. To attain an optimum clouding effect, in addition to a high refractive index of the metal oxides used, a series of other important properties of these metallic oxides is also necessary. These properties include the smallest possible tendency of the metal oxide to dissolve in the enamel liquid whereby the clouding effect would be automatically lost, the maximum favorable influence upon the chemical, mechanical, and thermal properties of the enamel, absence of toxicity, etc. Stannic oxide meets these requirements, and for this reason hitherto has proved to be the most nearly ideal solid clouding agent.

The gas clouding of enamel results from the use of certain materials added during the grinding process to white enamel frits, which are also previously clouded but of special composition; minutely small gas bubbles are produced in the enamel layer when the enamel is fired on, but they do not break through the surface of the enamel layer to any appreciable extent.

The clouding effect is produced in the same way as solid clouding, *i.e*, as a result of the difference in refractive index of the enamel liquid and that of the gas bubbles inclosed within it, similar refraction and diffusion phenomena of the incident light are produced, but with this difference, that the refractive index of the inclosed gas bubbles is smaller than that of the enamel liquid.

In gas clouding, an optimum effect must be attained in which the greatest possible number of the smallest possible gas bubbles is uniformly distributed through the most suitable enamel liquid, combined with the maintenance of a smooth, closed surface.

As in the case of so many discoveries, the effects of gas clouding were known much earlier than the causes. The fact has been known for a long time that the enamel clays placed in the mill have a clouding effect of varying magnitude. There are indeed individual enamel clays which possess this clouding power to such an extent that the addition of clouding agents is scarcely necessary when using specially adapted enamel batches. We now know that in this case also we are dealing with gas clouding. The gas is produced in part by the chemically combined water of hydration in the enamel clay which first splits off as a gas in the firing process and in part by the decomposition of organic substances present in many clays.

Gas clouding was discovered quite accidentally. Solid clouding agents were treated with organic acids during their process of preparation, and in instances where the organic acids were not completely removed after the preparation of the solid clouding agents, the solid clouding agent showed an abnormally strong clouding power. This effect could be explained only by crediting the numerous small gas bubbles which could be observed in the enamel liquid under the microscope with an additional clouding power, namely, the gas clouding.

After realizing that a discovery had been made, the next thing to do was to follow up this accidentally discovered gas clouding and to develop it for practical use.

The difficulties encountered were not small. It was first necessary to find organic compounds best suited to produce the desired effect and to determine the optimum additions of these organic compounds. Two measures necessary were (1) to find methods of expressing the clouding produced quantitatively inasmuch as the determination of clouding merely by comparison with the naked eye in a large number of experiments proved to be entirely unsuitable, and (2) to find a criterion of the extent to which the additions could be increased without incurring undesirable results, such as boiling.

It was important, furthermore, to distribute the organic compounds as uniformly as possible through the enamel, and enamel batches had to be found which would permit the attainment of optimum operating conditions.

(*To be continued*)

Schönbrunner Schosstrasse 21
Vienna 82, Germany

HISTORY OF THE CERAMIC GUILD OF CINCINNATI

In the spring of 1938, a small group of workers in clay met to discuss how they could meet their long-felt need of a kiln for firing their pottery pieces. Tam Deering, chairman of the Public Recreation Commission of Cincinnati, acted as chairman for several initial meetings. Harold Nash, professor of ceramics at the University of Cincinnati, was a leader in the informal discussions at these meetings.

Even among those ten or twelve persons who attended the first meetings, their interests in obtaining a kiln were surprisingly varied. In addition to those who felt a personal need for firing facilities for their professional studio work, there were some who wanted such facilities for the clay pieces produced in their leisure time as an avocation; some, who as teachers in the art, needed a kiln to make the results of modeling more permanent for their pupils; and some who were interested in a kiln as one way to promote ceramics among recreational and club groups, and even as a therapeutic means for the benefit of psychological problem cases who were under professional treatment.

Thus it was discovered that the needs and interests in ceramics were real and diverse. Each original promoter of this idea of a community kiln submitted the names of acquaintances whom he knew also to be interested. Notices of a meeting for reports on a canvass of the groups and institutions of the city who would like to become affiliated with a community-kiln project were sent to about one hundred individuals.

The result was a series of four or five meetings, each attended by thirty or forty persons who were ready to contribute their energies to the task of organization.

This series of meetings culminated in the drawing up (under legal advice) and acceptance of Articles of Incorporation of a Corporation not for Profit. Sixteen trustees were elected. Anyone who had attended at least one of the organization meetings was eligible for election; the sixteen receiving the greatest number of votes became the Board of Trustees and, in that capacity, signed the Articles of Incorporation.

The breadth and sincerity of purpose of the group of more than one hundred persons who attended the meetings and who organized the Ceramic Guild of Cincinnati are expressed in the statement of purpose of the Guild, namely:

To further and foster interest in the Ceramic Arts and to that end to maintain on a self-sustaining financial basis for the use of members of the Guild such equipment and property as may become available to, and under the legal control of, said corporation; to hold and manage endowment and other funds for the maintenance, replacement, and installation of such equipment and property; to hold and manage endowment funds for the support of similar activities conducted, or for institutions owned by other corporations not for profit, and to accept gifts for itself and for such endowment funds; to afford financial or other aid or assistance to other corporations not for profit, as now are or may hereafter be engaged in furthering the purposes above named, or any of them; to establish, maintain, promote, and endow, in whole or in part, any such corporations not for profit; in furtherance of said purpose or any of them, to acquire by deed, device, bequest, gift, purchase or otherwise, real and personal property, and to hold, invest, reinvest, manage, and dispose of the same.

No member of the corporation shall ever derive any dividends or profit therefrom. After the organization of the corporation, additional members thereof shall be elected by the Board of Trustees, upon the recommendation of one member. Membership shall cease upon resignation or death.

The officers and committee of the Ceramic Guild are as follows:

President: Erastus S. Allen (lawyer).

Vice-President: Henry E. Marley (instructor in ceramics, University of Cincinnati).

Secretary: Miss Mabel Madden (Public Recreation Commission).

Treasurer: Miss Wilhelmina Rehm (artist).

The Membership Committee is composed of Miss Rehm, *Chairman;* Miss Virginia Worthington, Cincinnati Art Museum; and Harold Bopp, Rookwood Pottery.

Anyone interested is eligible for membership; the dues vary according to type of membership: active $1.00; associate $10.00; sustaining $25.00; life, $100.00.

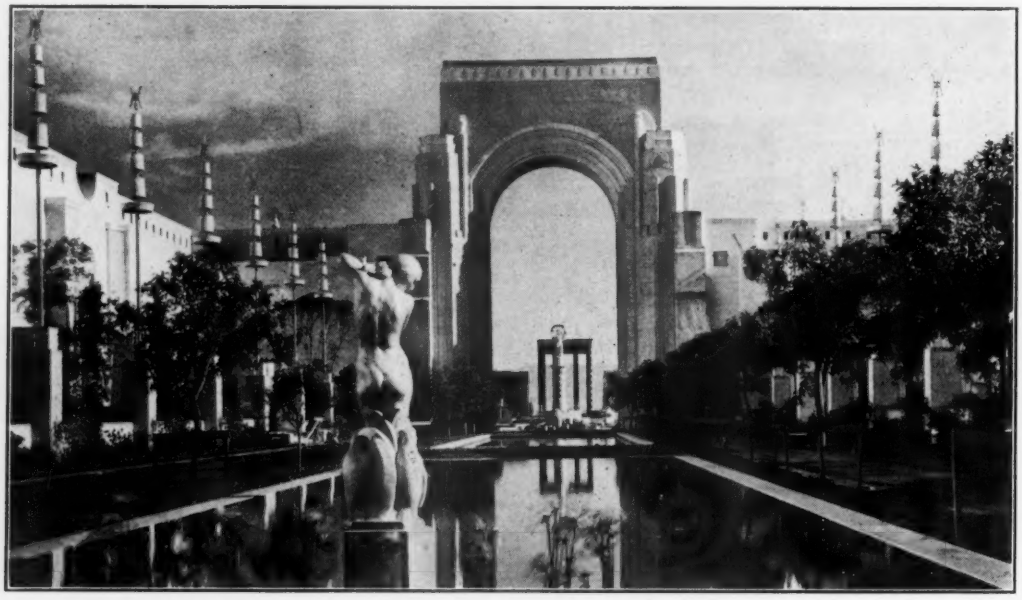
The response to this ceramic movement has proved that Cincinnati as a city is unique in its ceramic consciousness. This probably is due largely to the influence of Rookwood in the community. The possibilities of growth in this field as a community seem almost limitless. Cincinnati faces a new phase of history in its art life.

The work of the trustees this year has resulted in obtaining for the Guild the use of a room containing an unused kiln at Rookwood. The Guild will operate this kiln and a salesroom for dispensing, at cost, materials to be used in claywork.

The Guild will function as an organization entirely independent of Rookwood financially, yet as an organization affiliated in spirit to Rookwood, which has for more than fifty years been a leader nationally and internationally in the production of superior pottery.

The first public step of the Ceramic Guild in "fostering interest in the ceramic arts" was a lecture given by Arthur E. Baggs at the Cincinnati Art Museum on March 24. The Museum has generously aided the Guild in making this lecture possible.

—Mary G. Sheerer, *Cincinnati, Ohio*



Court of Reflections, Golden Gate International Exposition

A Heap of Living Makes the Home
A Heap of Study and Unremitting Work Brings Success
A Faint Heart Never Achieves
He Succeeds Who Determines So to Do

It Is only by Communication with Others That Knowledge Is Acquired;
Membership in American Ceramic Society Is an Opportunity
for These Achievements

PERMANENCE AS WELL AS BEAUTY

The above photo shows the Industrial Rayon Corporation's newly completed plant at Painesville, Ohio, which is known as the "World's Largest Glass Block Installation."

The 371,000 glass blocks used in this modern air conditioned factory were properly annealed in Simplex Lehrs assuring permanence and lasting beauty.

Simplex Lehrs were selected and used for tempering these blocks as well as other difficultly designed glass articles because of their ability to do superior quality annealing.

FRAZIER-SIMPLEX, INC.

ENGINEERS

436 EAST BEAU STREET WASHINGTON, PENNSYLVANIA, U.S.A.

Lusterlite enamels

Few, if any, frit manufacturers have enjoyed such a high percentage of unsolicited repeat-orders as "Chicago Vit." And nothing evidences so clearly both quality and service as automatic repeat orders. You, too, can depend on LUSTERLITE ENAMELS.

CHICAGO VITREOUS ENAMEL PRODUCT COMPANY
1411 SOUTH 55th COURT
CICERO • ILLINOIS

Bethlehem Products for the Ceramic Industry

88-80 CASTINGS
to save maintenance on grinding equipment

BETHLEHEM ABRASIVE-RESISTING PLATES
for chutes, hoppers, dump-car bottoms

BETHLEHEM TOOL STEEL
for dry press and repress liners

BETH-CO-LOY SHEETS
for long-lasting roofing and siding

WIRE ROPE
for all excavating and material-handling equipment

Also—Light Rails, Steel Ties and Track Equipment, Steel Pipe

BETHLEHEM STEEL COMPANY
General Offices BETHLEHEM STEEL **Bethlehem, Pa.**

Advertise in The Bulletin

Number of Insertions

	1 month	*3 months*	*6 months*	*12 months*
Full page	$66.00	$60.00	$52.00	$44.00
Half page	36.00	33.00	30.00	26.00
Quarter page	20.00	18.00	16.50	15.00
Eighth page	10.75	9.90	9.00	8.25

Classified advertisements: 35 words for $1.10 per insertion

Cover positions: list plus 25%

First page preceding or following reading matter: list plus 20%

Color rates: on application

Reading notices not accepted

CLAYS
English China and Ball

TALCS
for
HEATING ELEMENTS
CERAMIC BODIES
SAGGER USES

Ceramic Specialties Include
Whiting : Paris White : Magnesite
Cornwall Stone : Barium Carbonate
Zinc Oxide : Enameling Clays : Etc.

HAMMILL & GILLESPIE, INC.
Importers since 1848
225 Broadway New York

Ceramic Service? We Give It

We Manufacture—

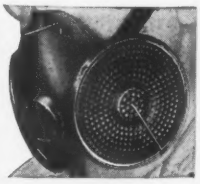
Pins—all shapes and lengths
Stilts
Thimbles
Spurs
Saggers
Crucibles
Tile for Decorating Kilns

We Sell—

Ball Clays—Kentucky
Sagger Clays—Kentucky
Ground Fire Clay—Ohio, Pennsylvania
Bitstone—all sizes
Fire Brick
Imported Paris White
Domestic Whiting
Georgia Kaolin
Modeling Clay

THE POTTERS SUPPLY COMPANY
EAST LIVERPOOL, OHIO

Specify DOUBLE WILLSON **GOGGLES and RESPIRATORS**



There's **PROFIT IN WILLSON PROTECTION**

Eye injuries and dust diseases cost the Ceramic Industry many thousands of dollars annually. You can prevent losses—increase profits, by a well conceived Safety Program.

To accomplish this, Willson offers a choice of more than 300 types of Goggles and ten Respirators approved by the U. S. Bureau of Mines under Schedule 21.

Respirators Nos. 750 and 750L, illustrated above, are Officially Approved for Type A and Lead Dusts respectively.

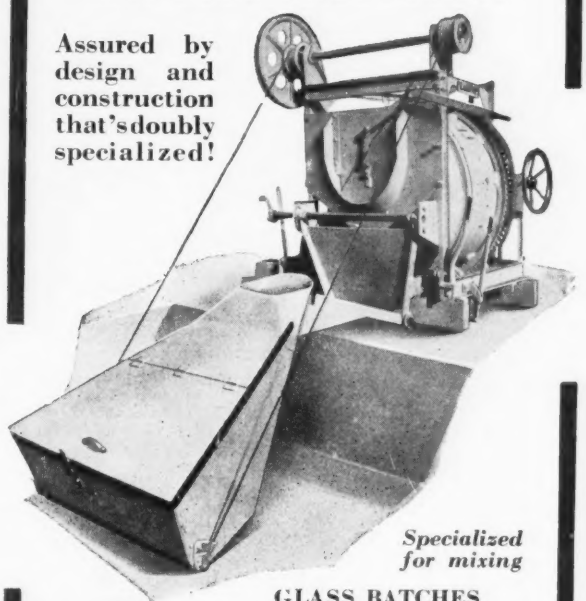
Style CC402 Goggle, also illustrated, is an over-spectacle goggle with transparent Sonite cups and Super-Tough lenses.

Write Today for Complete Catalog

DOUBLE WILLSON
PRODUCTS INCORPORATED
READING, PA., U.S.A.

LOW-COST PRODUCTION

Assured by design and construction that's doubly specialized!



Specialized for mixing

GLASS BATCHES
ENAMEL FRITS
REFRACTORIES

and specialized to meet your specific production conditions

Write for complete information
Industrial Division

Mixer Specialists since 1850

Ransome Concrete Machinery Co.
Dunellen, New Jersey

Ransome MIXERS

"CONTROLLED MIXING"

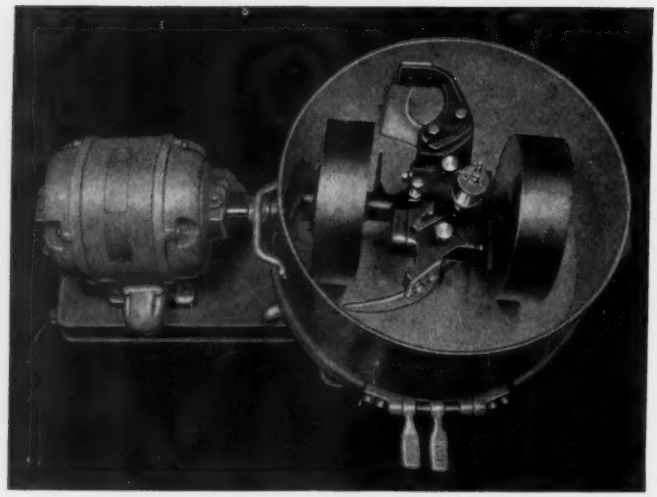
of ceramic bodies
by mulling in the

SIMPSON INTENSIVE MIXER

Progressive plants in all branches of the ceramic and refractory industries are securing important advantages and major production economies with inexpensive, flexible and closely controlled procedures in the preparation of their materials for forming.

It will pay you to investigate "controlled mixing" for your products, with the genuine muller-type Simpson Intensive Mixer recommended for this work.

Our Ceramic Engineer is available on request and will be glad to discuss your special requirements thoroughly and without obligation.



Laboratory size Simpson Intensive Mixer, equipped with removable crib, crosshead and mullers. The standard machine for test and control work on ceramic and refractory materials.

Manufactured by

NATIONAL ENGINEERING COMPANY

549 W. Washington Blvd., Chicago, Illinois, U. S. A.

Manufacturers and Selling Agents for Continental European Countries—The George Fischer Steel & Iron Works, Schaffhausen, Switzerland
For the British Possessions, Excluding Canada and Australia—August's Limited, Halifax, England
For Canada—Dominion Engineering Co., Ltd., Montreal, Canada. For Australia and New Zealand—Gibson, Battle & Co., Pty., Ltd., Sydney, Australia

BORAX *Guaranteed 99½%–100% Pure* BORIC ACID

Select the Brand which has back of it years of *successful use* by experienced Ceramists

Pacific Coast Borax Co., New York

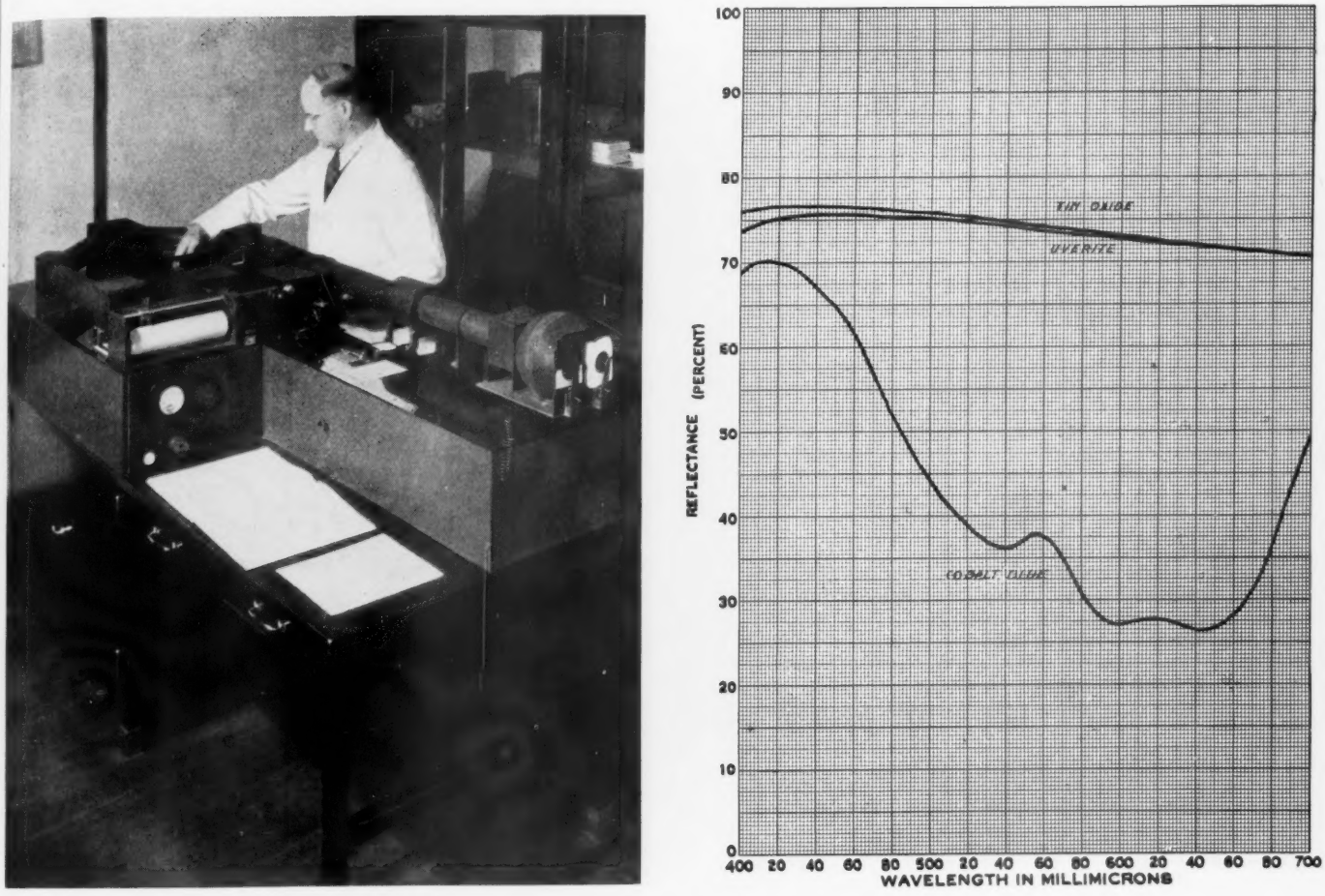
Chicago **Los Angeles**

BACK NUMBERS
OF
JOURNAL OF AMERICAN CERAMIC SOCIETY
AND ALL IMPORTANT MAGAZINES FROM THE WORLD OVER

We furnish single copies, volumes and sets or photostat reproductions of specific sections, reasonably and promptly

WRITE, PHONE OR WIRE PERIODICALS DEPARTMENT

THE H. W. WILSON COMPANY 950 University Avenue, New York



Spectrophotometer and typical chart—from Harshaw's Laboratories

SPECTROPHOTOMETRIC CONTROL

Color variation is disastrous to ceramic production schedules, whether on white or color runs. . . . Harshaw safeguards against such variation by controlling colors and ceramic chemicals spectrophotometrically.

The Spectrophotometer in Harshaw's laboratories takes the guesswork out of color control. This machine automatically draws an exact color curve for the test material. The curve instantly shows any color variation; and more important, spots the exact nature of the variation.

Accurate spectrophotometric control assures better ceramic chemicals and colors—and is one more reason for specifying "HARSHAW."

THE HARSHAW CHEMICAL CO.

Manufacturers, Importers, Merchants — Cleveland, Ohio, and principal cities

"CERAMIC" COLORS *For Satisfaction in Production*

COLORS

For Enamels:—Colors and Oxides; Smelter Oxides; Graining, Printing, Banding, and Screening Colors.

For Pottery:—Glaze and Body Stains; Underglaze and Overglaze Colors for Banding, Spraying, and Screening; Fritted Glazes and Fluxes.

For Glass:—Enamels; Vitrifiable Colors for Banding, Spraying, and Screening; Printing Colors; Fluxes; Batch Colors.

Decorating Supplies:—Printing Tissue; Screening Oils, French Fat Oil, Oil of Copaiba, Balsam Fir, Damar Varnish; Brushes; Knives and Spatulas; Grinding Mills.

CHEMICALS

Aluminum Hydrate
Ammonium Carbonate
Antimony Oxide
Antimony, Black Needle
Barium Carbonate
Barium Chromate
Bone Ash
Cadmium Carbonate
Cadmium Oxide
Cadmium Sulphide
Calcspar
Chrome Oxide, Green
Clay, Vallendar
Cobalt Oxide, Black
Cobalt Sulphate
Copper Oxides
Iron Chromate
Iron Oxides
Kryolith
Lead Chromate
Magnesium Carbonate
Manganese Dioxide
Nickel Oxide, Black
Nickel Oxide, Gray
Nickel Sulphate
Potassium Bichromate
Potassium Nitrate
Potassium Permanganate
Powder Blue
Rutile, Powdered
Selenium
Sodium Aluminate
Sodium Antimonate
Sodium Bichromate
Sodium Silicate
Sodium Silico Fluoride
Sodium Uranate
Tin Oxide
Titanium Oxide
Uranium Oxide, Orange
Uranium Oxide, Yellow
Zirconium Oxide

"CERAMIC" COLORS

CERAMIC COLOR & CHEMICAL MFG. CO., NEW BRIGHTON, PENNA.

HARTFORD-EMPIRE COMPANY

HARTFORD, CONN.

Engineers and Licensors

FEEDERS FORMING MACHINES CONVEYORS
STACKERS LEHRS

ORTON STANDARD PYROMETRIC CONES

For Forty-Three Years
The American Standard for
Control of Ceramic Heat Treatment

THE EDWARD ORTON, JR.,
CERAMIC FOUNDATION

George A. Bole, D.Sc., *Manager*

Laboratories & Office
1445 Summit Street—Columbus, Ohio

DU PONT
REG. U. S. PAT. OFF.

RESISTANT COLORS FOR GLASS

Increase the SERVICE LIFE of Decorative Labels for Glass Packages

STANDARD COLORS or intermediate shades for a particular match are now available for the manufacturers who require a truly resistant glass color for milk and beverage bottles.

Tests in the laboratory and by manufacturers show that new du Pont alkali-resistant colors are many times more resistant than older colors to the commonly used washing powders, strong soaps, alkaline detergents. The gloss is retained and the colors will hold up during the useful life of the package without fading, chalking or color disintegration.

These new du Pont resistant colors merit your immediate consideration. We will gladly cooperate in their specific application. Just write or call our nearest office.

Plan to visit the du Pont exhibits at the GOLDEN GATE INTERNATIONAL EXPOSITION in San Francisco—and at the NEW YORK WORLD'S FAIR

DU PONT
REG. U. S. PAT. OFF.

E. I. DU PONT DE NEMOURS & COMPANY, INC.
The R. & H. Chemicals Department
Ceramics Division Wilmington, Delaware
District Sales Offices: Baltimore, Boston, Charlotte, Chicago, Cleveland, Kansas City, Newark, New York, Philadelphia, Pittsburgh, San Francisco

1939 CERAMIC HISTORY

41st ANNUAL MEETING CHICAGO, ILLINOIS WEEK OF APRIL 16

Is Now In Ceramic History As The One Richest In Information Developed

and

Fellowships Broadened

The number of registrations:

Men	738
Ladies	42
Service	49
Press	8
Students	157
Total	994

Meetings already scheduled for this same calendar year are:

1. Golden Gate Exposition Ceramic Week — August 6-12, St. Francis Hotel.
2. Blue Ridge Ceramic Art Conference — Blue Ridge, N. C., August 17 and 18. Professor Kenneth Smith, Leader.

The Autumn Divisional Meetings are now being organized

1939 WILL MAKE CERAMIC HISTORY

CLAYS FOR EVERY CERAMIC NEED

AIR-FLOATED SHREDDED GROUND

UNITED CLAY MINES
CORPORATION
TRENTON . . . . NEW JERSEY

McDANEL REFRACTORY PORCELAIN COMPANY

Manufacturers of

PORCELAIN TUBES PROTECTION TUBES
INSULATING TUBING and BEADS

BEAVER FALLS PENNSYLVANIA

All Types of Circular and Straight Tunnel Kilns

SWINDELL-DRESSLER CORPORATION

Post Office Box 1888 Pittsburgh, Pa.

Lehrs and Enameling Furnaces, Electric and Gas Fired

Full Details Furnished on Request

THE MARK OF QUALITY

THE WORLD'S PEMCO FINEST

THE PORCELAIN ENAMEL & MFG. CO.
PEMCO and EASTERN AVES., BALTIMORE, MD.

EMERSON P. POSTE

CONSULTING CHEMICAL ENGINEER

ANALYSES: CERAMIC RAW MATERIALS AND PRODUCTS, FUELS, IRON AND STEEL, ETC.

SPECIAL INVESTIGATIONS: PHYSICAL AND CHEMICAL TESTS ON ENAMEL, ETC.

309 McCALLIE AVE.,
CHATTANOOGA, TENN.

THE SHARP-SCHURTZ COMPANY

CHEMISTS FOR THE CERAMIC INDUSTRY

WE HAVE FULLY EQUIPPED LABORATORIES AT

LANCASTER, OHIO U. S. A.

JOHN P. DALTON
Technical Ceramics

SPECIAL INVESTIGATIONS

RESEARCH

121 WARD PKWY KANSAS CITY, MO.

"EVER SEEN
YOUR TELEPHONE
SWITCHBOARD ?"
IT'S a fascinating sight — the inside of a telephone central office where your telephone may be connected with the whole Bell System.
Would you like to know more about the telephone and what happens when you make a call?
Your Bell Telephone Company will be glad to show you. Visitors are welcome and we believe you will have a most interesting time. Why not call the Business Office and arrange a visit?

BELL TELEPHONE SYSTEM

You are cordially invited to visit the Bell System exhibit at Golden Gate International Exposition, San Francisco

H. C. SPINKS CLAY COMPANY

Miners and Shippers of

BALL, SAGGER AND WAD CLAY

NEWPORT, KY.

May 1, 1939

Mr. Pete Potter
Comfortable Sanitary Pottery Mfg. Co.
Pottsville, Ohio

Dear Pete:

Well, Derby Time again!! Yes, I know Stagehand got sick last year, but this time it looks like Technician sure.

The technical papers and discussions at the Chicago Meeting of the American Ceramic Society showed that there are some "sure things" in the Ceramic business. The papers at these Meetings and the plant reports are continually proving that "SPINKS CLAYS are SURE THINGS." Bet on the favorite clays that are sure to keep you in the money!!

Yours for Good Luck and a Fast Schedule.

Sincerely,

Dick Carothers

General Manager
H. C. SPINKS CLAY COMPANY

RBC:MLN

MT and TIN OXIDE

for better glazes

METAL & THERMIT CORPORATION, 120 BROADWAY, NEW YORK, N. Y.